THE EFFECTS OF WALKING A LABYRINTH ON SYMPTOMS OF DEPRESSION AND ANXIETY AND LEVEL OF SELF-COMPASSION

By

SARA J. HILLS

Bachelor of Arts in Elementary Education
University of Iowa
Iowa City, Iowa
2000

Master of Science in Educational Psychology
Oklahoma State University
Stillwater, Oklahoma
2014

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Dissertation Approved:

John S.C. Romans, Ph.D.

Dissertation Adviser

Hang-Shim Lee, Ph.D.

Julie M. Koch, Ph.D.

Tonya R. Hammer, Ph.D.

Larry L. Mullins, Ph.D.

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Abstract: Exercise and meditation have been shown to improve wellness and to help maintain a healthy lifestyle, yet the effects of meditation and movement together have been largely ignored. This current mixed-methods study utilized a convergent independent three-arm design to explore the experiences and benefits of walking a labyrinth, a form of meditative movement (MM), as a complementary treatment for depression and/or anxiety. College students experiencing depression and/or anxiety who were at least 18 years old from a Midwest university were sequentially assigned to one of three groups: treatment (TG), active control (ACG), or wait-list control (WCG). TG and ACG participants completed 20 minute walking sessions once a week for four weeks in either a labyrinth (TG), on a rectangular path (ACG), or in a labyrinth following a wait period (WCG). This study sought to determine if MM in a labyrinth reduced symptoms of anxiety and depression and raised levels of self-compassion. Observation Oriented Modelling (OOM) results from pre- and post-measures of anxiety, depression, and self-compassion suggested participants in the ACG experienced the greatest reduction in symptoms of anxiety and participants in the TG may have seen the greatest increase in level of self-compassion. Phenomenological analysis of journal entries, naturalistic observations, and open-ended questionnaires suggested the vast majority of participants in both the TG and ACG enjoyed their sessions and found them to be peaceful, simple, and a welcome break from the stress of daily life. Four main themes were found in the qualitative data that may help readers to better understand the experiences of the participants: Expectations vs. Openness, Inner and Outer Contexts, Coping Mechanisms, and Distress Tolerance. Discussions of quantitative and qualitative data intersections are explored and future directions for investigating MM in a labyrinth as a complementary treatment are suggested.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Exercise and meditation have both been shown to improve wellness and to help maintain a healthy lifestyle, yet the effects of meditation and movement together have been largely ignored (Craft, 2005; Payne & Crane-Godreau, 2013; Salmon, 2001). Given the popularity, low-cost, simplicity, and convenience of mind-body therapies combined with the growing body of evidence suggesting that mind-body interventions, such as meditative movement (MM), are effective in reducing psychological distress and improving both physical and psychological wellness, it makes sense to continue to explore and utilize MM for the nonpharmacological treatment of depression, anxiety, and other psychological disorders (Bishop, et al., 2004; Chow & Tsang, 2007; Payne & Godreau, 2013). Results on effectiveness were mixed among the studies reviewed, although there were more positive results than neutral and no negative results. In other words, there seems to be no harm in using mind-body therapies such as Qigong, Tai Chi,

and other MM as complementary treatments (Chow & Tsang, 2007; Oh, Choi, Inamori, Rosenthal, & Yeung, 2013; Payne & Crane-Godreau, 2013).

Walking a labyrinth brings together the mind, body, and spirit. It is a walking meditation that promotes healing from physical and emotional pain and illness (Artress, 2006; Densford, 2007; Sandor, 2005). Further exploration of the effects of walking a labyrinth as a MM treatment for anxiety and depression is warranted in order to better understand the experience and benefits (Artress, 2006; Sandor, 2005; Sandor & Froman, 2006; West, 2000).

The ensuing literature review presents the concepts influencing the focus and current study of meditative movement (MM) study and walking labyrinths as a MM. Themes will be examined beginning with the prevalence and impact of anxiety and depression and current popular and effective treatments for anxiety and depression. The focus on exercise as a behavioral complementary and alternative treatment will then be discussed, followed by an exploration of the literature describing the newer studies of MM as a successful complementary and alternative treatment. A discussion of mindfulness as a central component of all MM activities and self-compassion as an alternative to the focus of self-esteem in the study of the impact of MM will be next. The review will conclude with a discussion of meditative walking and walking a labyrinth as a form of meditative walking that has yet to be fully explored.

Review of the Literature

Anxiety and Depression

The prevalence and impact of mental and behavioral disorders is high worldwide (DeVol & Bedroussian, 2007; WHO, 2001). The World Health Organization (2001)

reported that one in four families across the globe is experiencing the burden of a family member with a mental or behavioral disorder. Depression accounts for the largest number of mental health disorders affecting individuals worldwide (WHO, 2001). Depression affects approximately 5-13% of women and 2-8% of men at some point during their lifetime (Pincus & Petit, 2001, Kessler et al., 2003).

The cost and suffering associated with mental and behavioral disorders is not limited to severe disorders such as major depressive disorders only. Anxiety and panic disorders also have a large effect on individuals, families, and communities (Kroenke, Spitzer, Williams, Monahan & Löwe, 2007; WHO, 2001). Anxiety disorders are often present before or with major depression. Anxiety disorders are usually chronic, can be incapacitating, and cause a great individual and social burden. The economic costs of anxiety disorders include inpatient, outpatient, and emergency care; hospitalization; pharmaceutical treatment; reduced productivity; absenteeism from work; and suicide (Kroenke et al., 2007; Lépine, 2002). Anxiety and depression are the two most common mental health disorders and their comorbidity seriously impacts identification and treatment (Kroenke et al., 2007; WHO, 2001).

Treatment of Anxiety and Depression

Treatment of anxiety and depression has been dominated by psychotherapy and pharmacological interventions. Psychotherapeutic treatment is largely done using Cognitive Behavioral Therapy and behavioral interventions. Many individuals who suffer from depression and anxiety, however, do not seek traditional treatments in the form of therapy and medications. This is sometimes due to the stigma associated with mental health treatments or beliefs about the efficacy of psychological treatments (Payne &

Crane-Godreau, 2013; Gilpin, 2008; Salmon, 2001). In addition, some individuals do not respond to or engage in traditional psychotherapy and pharmacological interventions. Many of these individuals are now looking for their own alternative and complementary therapies such as exercise (Craft, 2005; Salmon, 2001).

Exercise as an Alternative and Complementary Treatment

Behavioral activation is a well-supported and common intervention used in the treatment of mood disorders (Chow & Tsang, 2007; Streeter et al., 2010). Regular exercise has been associated with decreased risk for developing several chronic illnesses such as diabetes, stroke, and coronary heart disease (Chow & Tsang, 2007; Prakhinkit et al, 2014). In addition, exercise buffers against the harmful effects of stress, is an anxiolytic, and an antidepressant. This is particularly true when anxiety and depression symptoms fall in the mild to moderate range (Chow & Tsang, 2007; Craft, 2005; Prakhinkit et al., 2014; Salmon, 2001). Effects of exercise on anxiety and depression symptoms compare positively with effects of pharmaceutical intervention and psychotherapy, and exercise may also be a more acceptable treatment for individuals who do not wish to engage in traditional psychotherapy and pharmacological treatment (Salmon, 2001; Streeter et al, 2010). Finally, exercise is easily accessible to the general population, while psychotherapy and pharmacological treatments are not (Salmon, 2001).

Mind-Body Exercise and Meditative Movement as an Alternative and Complementary Treatment

Mind-body practices such as yoga, meditation, tai chi, and guided imagery, are defined by the National Center for Complementary and Integrative Health (2016) as practices that "promote health by facilitating interactions among the brain, mind, body,

and behavior." MM interventions involve focused awareness on the body, some kind of instructed movement, observation of the breath, and deep relaxation. MM interventions have been shown to improve balance, calm the mind, induce relaxation, lower blood pressure, improve function of the immune system, reduce inflammation, increase overall general wellness, decrease anxiety and depression, and stimulate positive affect (Payne & Crane-Godreau, 2013).

Researchers have found evidence that MM is as effective as traditional exercise for reducing heart rate and blood pressure, improving balance, increasing bone density, increasing strength, and increasing aerobic capacity despite the fact that MM is gentle and involves mild to moderate exertion. MM participants in studies with control participants in traditional or athletic exercise groups experienced similar or better outcomes for improved physical health and overall better outcomes for emotional health (Oh et al., 2013; Payne & Crane-Godreau, 2013).

Further, some studies included in Payne and Crane-Godreau's review (2013) demonstrated evidence that MM intervention groups out-performed seated meditation controls decreasing symptoms of anxiety. Payne and Crane-Godreau (2013) and others found no evidence or report of adverse effects in any of the reviewed studies (Oh et al., 2013). Even in studies where small or no differences were observed between groups, advantages such as the ease, safety, and cost-effectiveness of engaging in MM activities warrant the consideration and use of MM interventions for psychological treatment. Perhaps even more encouraging, some researchers compared the effects of MM to traditional psychotherapies such as Cognitive Behavioral Therapy and determined that MM was equally successful (Payne & Crane-Godreau, 2013).

Several studies also found that many of the MM interventions required learning new skills (i.e. positions and training needed for yoga and Qigong) and therefore, training combined with practice time was necessary to achieve optimum results (Chow & Tsang, 2007; Payne & Crane-Godreau, 2013). Qigong and other MM may be difficult to master as the movements are specific and must be taught to participants. Many researchers concluded that most studies do not continue long enough for participants to master the movements (Payne & Crane-Godreau, 2013). Similar to traditional exercise, self-efficacy and motivation may also be enhanced when MM is incorporated into a lifestyle rather than used as a short-term intervention (Craft, 2005; Chow & Tsang, 2007; Gilpin, 2008; Payne & Crane-Godreau, 2013; Salmon, 2001; Sandor & Froman, 2006; Steptoe & Cox, 1988; Ströhle, 2009).

Self-Compassion

Several studies of the effects of MM on anxiety and depression include measures of self-esteem and have demonstrated that MM increased self-esteem which perhaps played a role in the mechanisms behind MM interventions (Payne & Crane-Godreau, 2013; Shin et al., 2013; Chow & Tsang, 2007; WHO, 2001). Self-esteem is defined as an evaluation of self in areas deemed important to the self (Barnard & Curry, 2011; Leary, Adams, Batts Allen, & Hancock, 2007; Neff, 2009; Neff & Vonk, 2009). While self-esteem is correlated to positive traits of psychological well-being, it is correlated to negative traits such as narcissism, ego defensiveness, and strict comparison to others as well (Barnard & Curry, 2011; Leary et al., 2007; Neff, Kirkpatrick, & Rude, 2007; Neff & Vonk, 2009).

Self-compassion is defined as kindness to self, a sense of belonging to human kind, and a here-and-now mindset (Neff, 2009). Self-compassion, as a construct, is correlated with several positive traits of psychological well-being (Barnard & Curry, 2011; Leary et al., 2007; Neff, 2009; Neff & Vonk, 2009). Self-compassion provides protection from severe impact of negative events and is often available when self-esteem reserves run out (Leary et al., 2007). Self-compassion also activates the same areas of the brain that are stimulated when others show compassion towards us; self-compassionate releases oxytocin and calms the parasympathetic nervous system resulting in feelings of warmth and contentment (Gilbert, 2009; Irons, Gilbert, Baldwin, Baccus, & Palmer, 2006). It is possible that self-compassion, rather than self-esteem, may be contributing to overall increases in the psychological well-being associated with MM interventions.

Meditative Walking as an Alternative and Complementary Treatment

Mindful walking or walking meditation is a frequently used form of mind-body intervention that has its roots in Buddhist practices. Mindful walking incorporates relaxation, awareness, breathing, and focused concentration with rhythmic walking (Prakhinkit et al., 2014; Salmon, 2001). Unlike traditional psychotherapy, where short-term interventions are becoming increasingly valued due to outside pressures from third party interests, mindful walking can potentially become a way of life. Long-term change incorporating MM such as mindful walking offers a treatment that becomes a lifestyle rather than a coping mechanism to utilize during periods of distress (Gilpin, 2008).

Walking allows individuals to fall into a natural rhythm that allows observation of thoughts and feelings while also feeling content and peaceful. Walking brings about clarity of thought and serves as a metaphor for life and the therapeutic process – as a

journey of steps, each taken one at a time (La Torre, 2004). Walking is an exercise that integrates motor and sensory function. It exercises the brain and is an activity that humans were meant to do. The bilateral movement involved in walking synchronizes the entire central nervous system (Weil, 1995).

Mild-intensity walking exercises are associated with psychological well-being (Asztalos, De Bourdeaudhuij, & Cardon, 2010). Researchers have found that meditative walking produces greater happiness than traditional exercise walking groups. For example, Shin, Y.-K. et al. (2013) demonstrated that meditative walking more effectively improves psychological well-being than traditional athletic walking. Prakhinkit et al. (2014) also explored the effects of Buddhist walking meditation and traditional aerobic walking on depression and reported that both exercise groups saw increases in functional fitness such as improvements in muscle strength, balance, flexibility, and cardiorespiratory endurance. Additionally, decreases in depressive symptomology were associated with the meditative walking group only. The authors concluded that Buddhist walking meditation was effective in improving functional fitness, decreasing depressive symptoms, and improving vascular reactivity. Buddhist walking meditation was, therefore, determined to produce more overall health improvements than traditional aerobic walking (Prakhinkit et al., 2014).

Walking a Labyrinth as an Alternative and Complementary Treatment

Moving through the labyrinth is a type of walking meditation. Labyrinths are believed to be one of the most effective walking patterns (La Torre, 2004). Labyrinths can be made of almost any material: stone, tile, grass, dirt, cement – even simple light and shadows – and are formed in a variety of shapes form the ancient Cretan labyrinth to

the traditional 11-circuit Chartres labyrinth to less traditional, unique forms (Artress, 2008). Figure 1 provides a visual sample of labyrinth shapes (Blonski, 2008; see Appendix A). Labyrinths are available for walking in many communities (Fairbloom, 2003; Wolfelt, 2009). There are over 1,000 labyrinths located in churches, parks, schools, medical centers, and gardens across the United States (Sandor, 2005). Despite the increased popularity and development of labyrinths in public spaces, knowledge of labyrinths is relatively limited in the general population (Fairbloom, 2003).

Much like the Buddhist walking meditation, walkers are encouraged to let go of expectations for their walk and experience whatever comes to them during the walk without trying to will the experience away. Walking in the labyrinth encourages acceptance of all emotions and feelings, openness to experience, and trust in the process (Sandor, 2005). Labyrinths can bring contentment to a difficult situation. They can produce a calming of the mind, allow for self-soothing, and make space for healing (Densford, 2007). "The labyrinth can be a tremendous help in quieting the mind, because the body is moving. Movement takes away the excess charge of psychic energy that disturbs our efforts to quiet our thought processes." (p. 25, Artress, 2008). Individuals who walk the labyrinth learn to trust that the path will eventually lead to the desired destination despite the twists and turns along the journey (Wolfelt, 2009).

Further, many therapists believe that experiential and multi-sensory interventions can have much greater impact than traditional talk therapy alone (Densford, 2007).

> "I encourage my psychotherapy clients to walk the labyrinth in my garden before our sessions to facilitate turning inward and leaving everyday pressures behind, and afterward to let the issues raised in

the therapy sessions settle into their psyches before returning to homes or jobs." (p. 10, West, 2000).

Movement around the circular labyrinth path affords client and therapist the opportunity to deepen their relationship, reduce anxiety, and lower resistance. Walking a labyrinth is not intended to replace or minimize other therapeutic interventions and approaches used in therapeutic sessions. It is meant to contribute and complement the traditional therapeutic process, enhancing treatment and the therapeutic relationship (La Torre, 2004).

In addition to the healing aspects of the labyrinth, it is possible that labyrinths that are accessible to the public help to provide a space for creative expression and improved well-being (Densford, 2007). Walking a labyrinth allows inner wisdom, creativity, and intuition to move forward to give guidance on relationships, work, well-being, and health (West, 2000). Acceptance of the use of labyrinths may also begin the process of destigmatizing mental health issues and treatment (Densford, 2007). "Much more research needs to be done to understand fully the magnificence of this sacred pattern." (p. 68, Artress, 2008).

The Current Study

The current study seeks to fill several gaps in the literature through mixed-methods inquiry into the effects and experiences of walking a labyrinth on symptoms of anxiety and depression and level of self-compassion. A dissertation study by J.W. Smith (2007) stated that research has shown that undergraduate college students experiencing distress do not typically choose to seek treatment at college counseling centers. These students will, however, seek to decrease symptoms and improve well-being through the

use of traditional exercise such as walking. Walking has been shown to be an effective intervention for distress in the college age population (Smith, 2007); however, the effects and experience of walking a labyrinth has not been explored in this population; therefore, this study will target the college student population.

Further, studies that only explore the effects of exercise on individuals who are experiencing mild to moderate symptoms of anxiety and depression may be susceptible to floor effects. That is, the participants may not be depressed or anxious enough to show improvements. Most research on the effects of exercise on depression and anxiety has been completed using participants "…who have not asked for these benefits." (p. 51, Salmon, 2001). Further, studies of the effectiveness of exercise, mind-body therapies, and MM have historically been plagued by limitations and weaknesses (Kinser & Robins, 2013; Oh et al., 2013; Payne & Crane-Godreau, 2013; Prakhinkit et al., 2014; Sandor & Froman, 2006). Recommendations have been stated in the MM literature to increase scientific rigor. Such recommendations include: ensuring the design matches the research questions, blinding, improving the kind and quality of control groups, detailing methods in order to allow for replicability, increasing sample sizes, etc. (Oh et al., 2013; Sandor & Froman, 2006; Kinser & Robins, 2013). In addition to the suggested modifications to improve the quality and replicability of MM studies, researchers recommend including qualitative methods to enhance the collected quantitative data and to deepen understanding of how individuals experience MM (Oh et al., 2013; Sandor & Froman, 2006; Kinser & Robins, 2013). In response to these recommendations, this study will aimed to incorporate the suggested modifications to increase rigor and used a mixed-methods approach that included both quantitative measures and qualitative

phenomenological inquiry to attempt to fully understand the effectiveness and experience of walking a labyrinth. Finally, additional effort was made to increase reporting transparency using the CONSORT guidelines where appropriate (Schulz, Altman, & Moher, 2010).

Purpose of the Study

The purpose of this mixed-methods study was to better understand the experiences of college students who experience symptoms of depression and anxiety who walk a labyrinth once a week for four consecutive weeks. A convergent independent design was used. This is a type of design in which quantitative and qualitative data are collected during the same time period, analyzed separately, and then merged. In this study, quantitative self-report measures provided evidence of symptom severity before and after treatment to test the effectiveness of walking a labyrinth as a complementary treatment option. Qualitative observations, journal entries, and open-ended questionnaire responses were used to explore the experience of walking in a labyrinth versus walking for exercise and helped to better understand the quantitative results (Creswell & Plano Clark, 2011).

It was hoped that through this mixed-methods approach, researchers would gain improved and deeper understanding of the experience of walking a labyrinth and the potential benefits toward improved mood, decreased self-criticism, and increased wellness. Further, it was anticipated that the results of this study will better inform treatment planning for anxiety and depression disorders, help to remove the stigma associated with mental health treatment, and provide evidence for the use of labyrinths as

a low-cost complementary treatment available to nearly everyone at any age or level of fitness who may be experiencing symptoms of depression and/or anxiety.

Research Questions and Hypotheses

The purpose of this study was to explore the experiences and benefits of walking a labyrinth as a complementary treatment for depression and/or anxiety and the potential mechanistic role of self-compassion. Based on the previously discussed literature the current study sought to answer the following research questions:

1. Does walking a labyrinth once a week for four weeks as a complementary treatment decrease symptoms of depression among college students who experience symptoms of depression and/or anxiety?
2. Does walking a labyrinth once a week for four weeks as a complementary treatment decrease symptoms of anxiety among college students who experience symptoms of depression and/or anxiety?
3. Does walking a labyrinth once a week for four weeks increase levels of self-compassion among college students who experience symptoms of depression and/or anxiety?
4. Does walking a labyrinth once a week for four weeks as a complementary treatment decrease symptoms of depression among college students who experience symptoms of depression and/or anxiety more than traditional walking and usual care/no treatment?
5. Does walking a labyrinth once a week for four weeks as a complementary treatment decrease symptoms of anxiety among college students who experience

symptoms of depression and/or anxiety more than traditional walking and usual care/no treatment?

6. Does walking a labyrinth once a week for four weeks increase levels of self-compassion among college students who experience symptoms of depression and/or anxiety more than traditional walking and usual care/no treatment?

7. What are the participants' experiences of the phenomenon of walking a labyrinth?

8. How does walking a labyrinth impact the daily lived experiences of participants?

Additionally, this study sought to explore the hypotheses that walking a labyrinth once a week for four weeks (TG) will (a) decrease symptoms of depression, (b) decrease symptoms of anxiety, and (c) increase levels of self-compassion for college students experiencing symptoms of depression and/or anxiety and further, (d) will reduce symptoms of depression and anxiety and increase level of self-compassion more than more than a traditional walking exercise treatment (ACG) and usual care/no treatment (WCG).

CHAPTER II

METHODS

Rationale for Mixed-Methods

A three-arm concurrent independent mixed-methods design was employed as recommended in the literature (Creswell & Plano Clark, 2011; Kinser & Robins, 2013; Payne & Crane-Godreau, 2013). A mixed-methods approached was used to explore the effects and experiences of the phenomenon of walking a labyrinth. Recent reviews and study of mind-body therapies and MM have led authors to recommend that researchers employ mixed methods methodologies (Kinser & Robins, 2013; Oh et al., 2013; Payne & Crane-Godreau, 2013; Sandor & Froman, 2006). The use of both qualitative and quantitative methods is required in order to capture the complexity of the effects of mind-body therapies (Creswell, & Plano, 2011; Kinser & Robins, 2013; Oh et al., 2013). Qualitative data is helpful in providing information about the in-depth experiences of participants allowing for better understanding of the effects of MM and enrich quantitative findings (Creswell & Plano Clark; Kinser & Robins, 2013; Sandor &

Froman, 2006). The benefits of using a mixed methods approach far outweigh any considered challenges (Kinser & Robins, 2013).

Quantitative measures were chosen from those most frequently used in the literature and qualitative inquiry was completed using a phenomenological approach. Phenomenology was applicable to the study of the experiences of participants walking a labyrinth because there was little known about the essence and meaning of the phenomenon of walking a labyrinth. Qualitative tools were also chosen from those recommended in the literature and included naturalistic observation, open-ended questionnaires, and journal entries kept during the course of treatment. A diagram of the procedures, Figure 2, may be found in Appendix B.

Sampling and Participants

Following approval by the Oklahoma State University Internal Review Board, participants were recruited through the use of flyers placed around Oklahoma State University's (OSU) main campus on public bulletin boards and in the counseling centers: Psychology Services, University Counseling Services, the Counseling and Counseling Psychology Clinic, and the Family Service Center. In addition, flyers were distributed via social media and emails sent to OSU's campus counselors and therapists so they could inform their clients of the opportunity to participate. A copy of the flyer used for this study can be found in Appendix C. Finally, participants were recruited through the use of the College of Education Sona System, an online research participation system. A priori power analysis indicated that 66 subjects were required (divided across the three participant groups) to reach an 80% power for detecting a medium effect size with the standard .05 level of statistical significance (Faul, Erdfelder, Lang, & Buchner, 2007).

Participants were chosen using criterion-based sampling methods and qualifying participants were sequentially assigned to one of three groups: TG, ACG, or WCG. WCG participants had the opportunity to participate in treatment following completion of the first four-week treatment process. Participants in all groups continued care as usual for the duration of the study.

Recruitment continued over an eight month period from the fall to spring semesters, and participants were sequentially assigned to one of the three groups as they entered the study. Participation was open to all students enrolled in at least once course at OSU over the age of 18 who were experiencing or had experienced depression and/or anxiety. In addition, qualified participants were screened during the consent process for contraindicated health issues and exercise readiness using the Physical Activity Readiness Questionnaire (PAR-Q).

Thirty-two individuals contacted the researcher to inquire about participation. Two of these individuals could not participate because they lived in another town and could not travel to the session locations often enough to be considered. One individual did not continue communication beyond asking about the study. Twenty-nine individuals completed the online consent and initial PAR-Q screening. Three individuals were ineligible due to potential health concerns as measured by the PAR-Q. Four individuals asked to leave the study, one before consenting and three after consent and pre-treatment surveys but before participating in a treatment session. Twenty-three individuals completed online consent, passed the PAR-Q screening, and completed pre-treatment surveys. Of those twenty-three, eight were sequentially assigned to the TG, eight to the ACG, and seven to the WCG. One individual in the TG cancelled the first treatment

session and did not respond to researcher requests to reschedule. One individual in the ACG attended two sessions and another attended one session; however neither responded to subsequent communications to schedule the next sessions. Three of the original seven WCG participants completed both pre- and post-surveys. Only one of the three responded to communication to schedule treatment sessions. The one person who responded completed all four treatment sessions following her time on the WCG. In conclusion, sixteen of the original twenty-three consented, eligible participants completed the survey to satisfaction (69.57%).

Participants (n = 16) were between 18 and 30 years of age (M = 21), weighed between 155 and 335 pounds (M = 160), were between 5'3" and 5'9" (M = 5'5"), and all identified as female. Eight of the sixteen participants worked in addition to taking classes. One participant identified as bisexual and the remaining participants identified as straight or heterosexual. Four participants categorized themselves as African American, one categorized herself as Asian, and the remainder of the participants categorized themselves as Caucasian or White.

Nine participants reported no engagement in exercise, two participants indicated that they worked out "occasionally," one reported that her only exercise was walking to and from class, one indicated that she worked out 1 to 2 times per week, two indicated that they worked out 3 to 4 times a week, and two reported that they worked out vigorously 5 to 6 days a week. Participants reported receiving treatment from a physician for a variety of reasons both for physical and emotional health including two participants who were engaged in ongoing monitoring of SSRI antidepressants. Several reported treatment by a physician, but did not indicate the reason for treatment. One participant

reported engagement in chiropractic care, and two reported engagement in psychiatric care. Two participants reported engaging in bi-weekly counseling or therapy, one for anxiety and one for anxiety and depression. Two participants reported diagnoses of neurodevelopmental disorders. Four participants reported using prescription SSRI antidepressants. Table 1 provides a breakdown of participant characteristics by group (see Appendix D).

Data Collection

All demographic information, quantitative data, and open-ended interview questions were collected via the online survey platform Qualtrics. Participants were assigned a numerical code after screening, and this code was used to label all participant data. Names associated with numerical codes were kept in a password protected Word document on a password protected computer separate from the remaining research documents and data. Electronic data was password protected on Qualtrics and additionally password protected via the computer log-in.

Other qualitative and hard copy data was locked in a filing cabinet in a locked room. Triangulation of qualitative data sources was used to ensure trustworthiness and credibility (Creswell, 2013). Qualitative data sources included the online open-ended interview questions, naturalistic observation, and journal entries. Naturalistic observation notes were labeled using each participant's numerical code only. Journals were kept by participants during the duration of treatment. Journals were collected and stored in a locked filing cabinet in a locked room at the end of the treatment period. Data was de-identified to the greatest extent possible to protect the identities of the participants, and data will be destroyed five years after the publication of this dissertation.

Following initial screening, qualified participants were emailed a link to an online Qualtrics survey. The survey began with a consent form and the PAR-Q. Continuing to the next page of the survey indicated participant understanding of the consent form and confirmed consent and ability to participate (see Appendix E for a copy of the consent and release of liability forms). The remainder of the survey included a demographics sheet, the Generalized Anxiety Disorder – 7 (GAD-7)), Patient Health Questionnaire - 9 (PHQ-9), and Self-Compassion Scale Short Form (SCS-SF). Participants who answered "yes" to one or more questions on the PAR-Q were thanked for their willingness to participate but were not allowed to continue to the remaining measures as it may have been harmful for them to begin a new exercise routine without the supervision of a physician. Following the online completion of consent and successful completion of the initial measures, participants were contacted to schedule the first treatment session or informed of their position on the WCG. Please see the Appendix F for a copy of the demographic questionnaire and Appendix G for copies of the PHQ-9, GAD-7, and SCS-SF.

Qualifying participants completed one walking session a week for four weeks or were assigned to the WCG. Each participant was offered $5 at the completion of each session or two research credits at the completion of all sessions and surveys as compensation. Compensation was used in-line with recommendations from the current literature as a way to discourage attrition (Payne & Crane-Godreau, 2013). Each session consisted of either a labyrinth walking session (TG) or an exercise walking session (ACG). Each session was approximately 20 minutes in length. Participants were told that they were participating in a study to determine the effects of mild and moderate

intensity walking exercise on symptoms of anxiety and depression and were not told to which group they had been assigned. The blinding of the true intent of the study was used as a technique to increase rigor by controlling participant expectations (Kinser & Robins, 2013; Payne & Crane-Godreau, 2013). Participants in the labyrinth TG were asked to notice or observe their breath as they walked as this is a frequently used prompt for MM (Gilpin, 2008; Payne & Crane-Godreau, 2013). Participants in the traditional walking ACG were asked to ensure that their breathing was too fast to sing, but slow enough to carry on a conversation as this is an indicator of moderate exercise intensity (Mayo Clinic, 2016).

Previous studies have used different contexts and varying methods between treatment and control groups resulting in a lack of consistency and inability to replicate results (Payne & Crane-Godreau, 2013; Kinser & Robins, 2013; Oh et al., 2013). For the current study, labyrinth walking took place at the Morrill Hall Labyrinth on the main campus of OSU. The Morrill Hall Labyrinth is located in an active area on campus with buildings on the east and west sides of the labyrinth and parking on the north and south sides of the labyrinth. This labyrinth is a non-traditional, unique labyrinth designed by OSU landscape coordinator, David C. Brown. The design is based on the Fibonacci Spiral, a mathematical ratio found in nature, and the length of the circuit from start to finish was 305 feet. The labyrinth's three sides are intended to represent mind, body, and spirit, and the overall structure most closely resembles that of the Petal Vessica shown in Figure 1. Figure 3, a picture of the Morrill Hall Labyrinth is located in Appendix H.

Exercise walking took place on a rectangular sidewalk path around a patch of grass and formal hedges commonly referred to as the Library Lawn near the Formal

Garden on the OSU main campus. This area of campus is also an active area. It is bordered by the Formal Garden to the south, additional sections of the library lawn and sidewalks to the north, a seating area on the east, and a sidewalk and lawn area on the west. The total length of one circuit through this section of the Library Lawn is approximately 550 feet. Figure 4, a picture of the rectangular exercise path is located in Appendix H.

Both the treatment and control groups walked in similar outdoor locations on the OSU campus, were given a prompt to pay attention to their breath, and walked for approximately 20 minutes. Participants had equal time with the researcher during their walking time as the researcher was present conducting naturalistic observation and timing of both labyrinth and exercise walking conditions. Further, the researcher attempted to control for researcher influence on participants by using prewritten scripts and similar contact methods for all participants. Copies of scripts used are located in the Appendix I. Participants were contacted via email or text message, per their preference, to remind them of upcoming sessions in an effort to decrease attrition. At the end of their walking sessions, for those requesting monetary compensation, participants were paid $5, the next session was scheduled, and the researcher reminded participants to continue to journal about their experiences between sessions. For those requesting research credit compensation, the next session was scheduled and the researcher reminded participants to continue to journal about their experiences between sessions.

Quantitative Data Collection

Four quantitative measures were used for this study: the Physical Activity Readiness Questionnaire (PAR-Q), the Generalized Anxiety Disorder – 7 (GAD-7), the

Patient Health Questionnaire - 9 (PHQ-9), and the Self-Compassion Scale Short Form (SCS-SF). The following is a description of each measure and the rationale for use. Copies of all measures can be found in the Appendix G.

The Physical Activity Readiness Questionnaire (PAR-Q). The PAR-Q was designed to be a self-administered screening questionnaire. It is recommended for use before beginning physical activity. The PAR-Q is used to identify those few individuals who may be at risk when initially increasing their current exercise level. Individuals who answer "yes" to one or more of seven basic questions are advised to contact their doctors before beginning or increasing physical activity. Individuals who answer "no" to all seven questions are encouraged to begin daily physical activity. The revised version of the PAR-Q is recommended by The Canadian Society for Exercise Physiology, The American College of Sports Medicine Guidelines for Testing and Prescription4, and The American Heart Association/American College of Sports Medicine Joint Position Statement Recommendations for Cardiovascular Screening, Staffing, and Emergency Policies at Health/Fitness Facilities5 as a standard for self-reported screening of physical activity readiness. In addition, these sources endorsed self-screening as an appropriate tool prior to consulting with a physician and stated that the PAR-Q provides fewer false positive results than other screening tools ensuring that there are fewer unnecessary referrals to physicians (Adams, 1999; Whitfield, Pettee Gabriel, Rahbar, & Kohl, 2014).

Self-Screening for activity readiness was employed in several of the exercise studies reviewed for this study (Craft, 2005; Salmon, 2001). Self-screening for activity readiness was determined to be appropriate for this study as well, because this study involves an ACG exercise walking. The PAR-Q was used to allow participants to self-

report medical conditions that may be contraindicated for beginning an exercise program. Participants who answered "yes" to one of the seven health questions were excluded from participation. Participants who answered "no" to all seven questions were assumed appropriate for beginning the mild to moderate intensity walking exercise used in this study.

The Patient Health Questionnaire – 9 (PHQ-9). The PHQ-9 is a nine-item, self-report abbreviated version of the full PHQ that has been found useful in screening and diagnosing depression. It is particularly responsive to changes of symptom severity over time; therefore, the PHQ-9 is used as a measure to assess the symptom severity for initial treatment planning and to assess symptom severity outcomes after treatment (Löwe, Unutzer, Callahan, Perkins, & Kroenke, 2004; Kroenke, Spitzer, Williams, & Löwe, 2010). The PHQ-9 has recently begun to rival the Beck Depression Inventory – II (BDI-II) as the preferred measure of depression symptoms. This is in large part due to the fact that the PHQ-9 is shorter than the BDI-II, is free, and does not over identify severe levels of depression as often occurs with the BDI-II. Internal consistency ratings for the PHQ-9 range from moderate to strong (Chronbach's alpha = .81, .72-.86). Internal consistency is slightly lower than that of the BDI-II; however, authors suggest that this may be due to the fact that the PHQ-9 has a fewer number of items. Sensitivity to change was rated higher for the PHQ-9 than for the BDI-II; however, both measures detected significant changes in symptom severity from pre- to post-treatment. Moderate correlations were observed between the two measures at both pre- and post-treatment, r =.72 and r =.73 respectively (Nickolai, Dear, McMillan, Anderson, Zou1 & Sunderland, 2011). Due to the apparent psychometric similarities between the PHQ-9 and the BDI-II,

the PHQ-9's better performance in detecting change in symptom severity, and the aforementioned benefits of using the PHQ-9 (i.e. it is free and contains fewer items), the PHQ-9 was used to measure changes in depressive symptoms for this study.

The Generalized Anxiety Disorder – 7 (GAD-7). The GAD-7 is a seven item self-report measure that was originally developed to aid in the diagnosis and monitoring of Generalized Anxiety Disorder; however, it has also been shown to be effective as a screener and monitoring tool for severity of symptoms associated with panic disorder, post-traumatic stress disorder, and social anxiety disorder (Spitzer, Kroenke, Williams, & Löwe, 2006; Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007). A study examining the reliability and consistency of the GAD-7 with a clinical heterogeneous populations reported that the GAD-7 was less sensitive as a diagnostic tool, but performed better as a severity monitoring tool. Effect sizes for sensitivity to change were large for Generalized Anxiety Disorder (GAD), Panic Disorder (PD), and Post-Traumatic Stress Disorder (PTSD). Effect sizes for sensitivity to change were moderate for Social Anxiety Disorder (SAD). Researchers found no differences related to gender, age, marital status, ethnic status, racial status, education, or total number of Axis I diagnoses. Pre- and post-treatment internal consistency alphas were good for the total sample and for individual anxiety diagnoses ranging from .81 to .88. The GAD-7 also showed good convergent validity with other measures of anxiety disorders with *r*'s ranging from .72 to .74. Discriminant validity also appears to be good, but the authors caution that further study of discriminant validity is required as this is believed to be the first study to consider discriminant validity comparisons. In addition, the author's conclusion that the GAD-7 may not be a good diagnostic tool for anxiety disorders may not be worrisome as the

purpose of this study was to monitor symptom severity not to provide diagnosis. For this purpose, the GAD-7 does the job well (Beard & Björgvinsson, 2014).

The Self-Compassion Scale Short Form (SCS-SF). The Self-Compassion Scale Short Form (SCS-SF) is a 12 item, self-report measure used to determine level of self-criticism and self-compassion. The short form version is as reliable as the long from and is believed to follow the same factor structure. The SCS–SF was shown to have adequate internal consistency (Cronbach's alpha ≥ 0.86), and it demonstrated a near-perfect correlation with the SCS Long Form ($r \geq 0.97$; Raes, Pommier, Neff, &Van Gucht, 2011; Castilho, Pinto-Bouveia, & Duarte, 2015). The SCS long and short forms propose a six-factor model that includes: self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification (Raes et al., 2011). For the purpose of this study, the SCS-SF was used to measure levels of self-compassion before and after treatment.

Qualitative Data Collection

Two open-ended online interviews were used to collect data about the participants' experiences with depression and/or anxiety and with walking the labyrinth (TG) and traditional walking exercise (ACG). Each of the open-ended online interviews can be found in the Appendix J. Both were part of the post-treatment data collection.

In addition, naturalistic observation was used to collect data to document the walking process. The recommended average time spent walking a labyrinth is 20 minutes (Sandor, 2005). Therefore, 20 minutes was the expected average time spent walking for both the TG and ACG. The researcher timed each walk during the course of treatment, and the researcher noted whether or not participants stopped or paused during the course of walking.

Finally, each participant kept a journal for the length of the study. Participants were prompted at the end of each session (once a week) to simply write about their experiences related to the study. These three data collection procedures helped to ensure consistency and trustworthiness of the data collection and analysis procedure, by using multiple sources to support findings with a technique called triangulation (Creswell, 2013).

Data Analysis

Due to the fact that this study failed to meet traditional statistical assumptions, and total number of participants did not meet the a priori sample size estimate, statistical analysis beyond descriptive statistics was inappropriate (Stevens, 2009). Additional quantitative data analysis was completed using Observational Oriented Modeling (OOM) for the three groups on three variables: severity of anxiety and depression symptoms and level of self-compassion pre- and post-treatment (Grice, 2011). OOM is intended to identify the number of observations that meet an expected researcher-defined pattern of results. OOM does not require traditional statistical assumptions (e.g. population normality, homogeneity of variances) and is therefore similar to non-parametric methods of data analysis (Grice, 2011).

In addition, data analysis included analysis of the qualitative data collected from the three groups. Analysis took place through the identification of themes following a phenomenological approach. The researcher and two team members analyzed the data to identify significant statements, a process referred to as horizonalization (Moustakas, 1994). The use of a three-person research team further enhanced the confidence and trustworthiness of this study through the continued use of triangulation (Creswell, 2013).

Following horizonalization, significant statements were grouped, aligning similar information into clusters of meaning then further reduced into themes in an attempt to understand the rich experiences of the participants. Next, textural and structural descriptions were developed in order to understand the "what" and "how" of the participants' experiences. Last, the researchers composed a short description of the "essence" of the walking a labyrinth that is intended to help readers understand the lived experiences of participants in this study (Creswell, 2013). Finally, quantitative and qualitative results were merged in the discussion section.

Reflexivity and Assumptions

The researcher participates in mind-body therapies such as yoga, meditative walking, and seated meditation on a regular basis. The researcher believes these practices are beneficial. The researcher also believes that a common factor between most forms of distress and pathology is shame. This means that the researcher believes that increasing self-compassion is an important step in in the process toward increased psychological well-being. The researcher has had some experiences walking a labyrinth and those experiences have been positive. These experiences and beliefs naturally lead the researcher to biases related to hope for a positive outcome for walking a labyrinth as a complementary treatment. Further, the researcher assumes that there is no harm in walking a labyrinth as a complementary treatment. The researcher also assumes that mind and body work in tandem; therefore, intervention and treatment must to target mind and body to be optimally successful.

These experiences, beliefs, and assumptions may lead the researcher to ignore data that does not support the researcher's hopes and expectations. In an effort to bracket

these hopes, expectations, and biases, the researcher memoed throughout the course of the research process. In addition, because this dissertation is the work of one primary researcher, this researcher consulted with others, including her advisor and colleagues, throughout the study and employed the assistance of two team members who helped analyze qualitative data. Further, the researcher consulted with Dr. James Grice, creator of the OOM analysis procedure and software in order to ensure accuracy of analysis and reporting.

Finally, the researcher is trained in Cognitive Behavioral Therapy and Acceptance and Commitment Therapy. This training may have influenced the development of themes in that the themes appear to align well with these therapies and with Acceptance and Commitment Therapy in particular. The researcher became aware of this during qualitative analysis and intentionally chose two additional team members whose theoretical lenses varied from the main researcher's. One team member was a recent graduate of the Masters in Counseling program at OSU and was employed as a career counselor at the time of analysis. He reported that his theory of choice was a blend of relational cultural and existential theories. The second team member was a current student in the Masters in Counseling program who reported that she felt that she had not firmly decided on any one theory at the time of the study. The choices of theme categories and thematic descriptors were determined as the "best" fit for the data by consensus of the team members.

Ethical Considerations

While there are believed to be no adverse effects associated with walking a labyrinth, there was potential for those who are diagnosed with anxiety disorders to

experience the context of exercise as panic and anxiety-inducing. The physical context of their own bodies (i.e. rapid breathing, rapid heart rate, sweating, etc.) may feel so similar to an actual panic or anxiety attack that these perceptions may trigger an attack or cause distress for participants. Therefore, a statement of the possibility of this experience was included in the consent process and the researcher monitored for this rare occurrence during sessions.

Compensation for participation is always an ethical concern (Barnett & Johnson, 2008). College students are often financially stressed, sometimes need research credits for their courses, and may be considered a vulnerable population. Compensation has been included in this study to attempt to keep attrition rates low as attrition is a problem with mind-body studies, particularly with studies employing a WCG (Payne & Crane-Godreau, 2013). The researcher considered compensation of $5 to be low enough that it did not prey upon students who may have been struggling financially and yet high enough to encourage participation. The researcher used the OSU College of Education Sona guidelines for appropriate research credit-to-time ratios, and OSU requires that professors offer alternative ways to meet research requirements for their courses in addition to participation in research (Oklahoma State University, 2017). The researcher worked to stay aware of situations that may seem as though participants were lured by compensation rather than interest in the study objectives. No ethical issues with compensation were observed during the course of this study.

Next, depression and anxiety disorders are sometimes accompanied by self-harm or other crisis situations. All pre- and post-survey responses were screened for potential self-harm behaviors or crisis situations. Any potential risks were promptly identified,

participants were contacted to ascertain the level of risk, and when necessary, the researcher provided a list of appropriate mental health resources.

Participants shared personal information during the study in their journals or interactions with the researcher. All such information was de-identified to the furthest extent possible in order to protect the privacy of the participants. Information that was deemed important to the reporting of results was de-identified and all participants were informed during the consent process that de-identified personal information may be used in a published manuscript. Further, the researcher's advisor, analysis team members, and those consulted during the course of the study were reminded of confidentiality and ethical concerns. In addition, each of these individuals had access to only the de-identified, numerically coded data.

Finally, this study was approved by the Internal Review Board at OSU before recruitment and data collection began (a copy of Internal Review Board approval is available in Appendix K).

Trustworthiness

Two additional team members joined the researcher to conduct qualitative analysis in an attempt to increase confidence and trustworthiness of results. Independent analysis of qualitative data was conducted, followed by team meetings held to discuss analysis and come to consensus on initial codes, themes, and eventually the final essence of the participants' experiences (Creswell, 2013; Saldaña, 2013). Triangulation, therefore, took place with both triangulation of data and triangulation of researchers (Creswell, 2013). Finally, reporting methods of all results followed recommendations

from the literature, and the researchers worked to be transparent and detailed (Kinser & Robins, 2013; Payne & Crane-Godreau, 2013; Schulz, Altman, & Moher, 2010).

CHAPTER III

RESULTS

Quantitative Data Analysis

Quantitative data was analyzed using Observation Oriented Modeling (OOM; Grice, 2011). OOM was utilized to represent the relationship between pre- and post-survey scores on the PHQ-9, GAD-7, and SCS-SF as predicted by the hypotheses. Hypotheses a, b, and c predicted that walking a labyrinth once a week for four weeks would decrease symptoms of depression and anxiety and increase level of self-compassion for college students who experience depression and/or anxiety. OOM allowed the researcher to determine the expected pattern of change and compare this expected pattern against the actual data observed to see how many of the participants'

score changes matched the expected pattern of change. The expected ordinal patterns for the TG pre- and post-scores for each of the three measures are shown in Figure 5 found in Appendix L. The Ordinal Pattern Analysis in OOM simply indicates the percent of correct classifications (PCC index) or the number of times that the actual pattern of pre- and post-scores matched the expected pattern of pre- and post-scores for each participant. The remaining hypotheses predicted that TG would out-perform both the ACG and WCG. The magnitude of change was expected to be highest for the TG and lowest for the WCG. The expected pattern for the magnitude of change between groups is shown in Figure 6 found in Appendix L.

Beyond simply comparing the observed ordinal pattern to the predicted ordinal pattern, the OOM procedure offers a *c*-value. The *c*-value is a probability statistic that is similar to the *p*-value (Grice, 2013). The *c*-value is calculated by taking the paired observed scores and shuffling them a chosen number of times. As an example, for this study's data, the seven paired scores on the PHQ-9 for the TG are essentially pasted to the sides of two seven-sided imaginary die, one die for pre-treatment scores and one die for post-treatment scores. In this case, these dice are then rolled 1000 times to determine how often the exact pairings of scores for these seven participants is observed in the 1000 random sets. A high *c*-value is interpreted to mean that the results were not very unique and could likely have occurred by chance. A low *c*-value is interpreted to mean that the results are unique and less likely to have occurred by chance. Obviously, a low *c*-value is preferred.

Quantitative Data Results

Depression

Changes in depression symptoms pre- and post-treatment as measured with the PHQ-9, are shown in Table 2. Self-report depression scores from the PHQ-9 did not change as expected for the TG. Data were complete for the TG and included seven cases. Of the seven pairs of observed pre- and post-treatment scores, two of the cases fit the expected ordinal pattern (28.57% PCC Index; $c = 0.89$). In other words, two of the seven participants in the TG reported decreased symptoms of depression from pre- to post-treatment. The range of pre- and post-treatment depression scores for TG was 2 to 18 (M =10.43) and 3 to 21 ($M = 10.14$) respectively.

Data for the ACG was complete and included six cases. Of the six pairs of observed pre- and post-treatment scores, four of the cases fit the expected ordinal pattern (66.67% PCC Index; c =0.33). In other words, four of the six participants in the ACG reported decreased symptoms of depression from pre- to post-treatment. The range of pre- and post-treatment depression scores for the ACG was 4 to 15 ($M = 9.83$) and 2 to 12 ($M = 6.50$) respectively.

Data for the WCG was also complete and included three cases. Of the three pairs of observed pre- and post-treatment scores, two of the cases fit the expected ordinal pattern (66.67% PCC Index; c =0.23). That is, two of the three participants in the WCG reported decreased symptoms of depression following no treatment. The range of pre- and post-treatment depression scores for the WCG was 10 to 18 ($M = 15.67$) and 9 to14 ($M = 14.00$) respectively.

Next, the hypothesized ordinal pattern of magnitude of change for each group (i.e. TG > ACG > WCG) did not match the actual ordinal pattern of change for pre- and post-treatment scores. The relative magnitudes of changes in depression scores for each group were as follows: ACG > WCG > TG. The range of pre- to post-treatment change scores for the TG, ACG, and WCG were -3 to 10 (M =.71), -3 to 15 (M =4.83), and 0 to 5 (M =1.67) respectively. When comparing the TG and ACG, there were 42 potential pairs of participants who could be compared in terms of their change scores. Of these 42 potential pairs, ten pairs were correctly classified (23.91% PCC Index; c = 0.93). When comparing the TG and WCG, there were 21 potential pairs of participants. Of these 21 potential pairs, four pairs were correctly classified (19.05% PCC Index; c = 0.94). When comparing the ACG and WCG, there are 18 potential pairs of participants. Of these 18 potential pairs, 11 pairs were correctly classified (61.11% PCC Index; c = 0.34). The magnitude of change for each group is shown in Table 3 including the number of correct pairwise classifications, PCC Index; and c-value for the pairwise comparisons of each group.

The largest overall gains were observed with the ACG and the smallest overall gains were observed in the TG. Results, therefore, appear to suggest that the TG did not effectively decrease symptoms of depression more than the ACG or WCG. However, taking the c-values into account, none of the depression score pattern of change and magnitude of change results were very unique (see Table 2 and Table 3). Results will be further explained in the discussion section.

Anxiety

Changes in anxiety symptoms measured with the GAD-7, are also shown in Table 2. Self-report anxiety scores from the GAD-7 did not change as expected for the TG. Data were complete for the TG and included seven cases. Of the seven pairs of observed pre- and post-treatment scores, two of the cases fit the expected ordinal pattern of reduced anxiety symptoms following treatment (28.57% PCC Index; $c = 0.67$). The range of pre- and post-treatment anxiety scores for the TG was 4 to 20 (M =10.71) and 5 to 15 ($M = 9.00$) respectively.

Data for the ACG was complete and included six cases. Of the six pairs of observed pre- and post-treatment scores, six of the cases fit the expected ordinal pattern of decreased anxiety symptoms following treatment (100.00% PCC Index; $c = 0.02$). The range of pre- and post-treatment anxiety scores for ACG was 5 to 18 ($M = 12.17$) and 2 to 17 ($M = 7.33$) respectively.

Data for the WCG was also complete and included three cases. Of the three pairs of observed pre- and post-treatment scores, two of the cases fit the expected ordinal pattern of decreased anxiety symptoms following no treatment (66.67% PCC Index; $c = 0.50$). The range of pre- and post-treatment anxiety scores for the WCG was 8 to 19 ($M = 12.33$) and 4 to16 ($M = 10.33$) respectively.

Again, the hypothesized ordinal pattern of magnitude of change for each group (i.e. TG > ACG > WCG) did not match the actual ordinal pattern of change for pre- and post-treatment scores. The change scores from pre-treatment to post-treatment were again computed for each participant on each of the three measures and the variable change score was compared pairwise using the OOM software. The relative magnitudes

of changes in anxiety scores for each group were as follows: ACG > WCG > TG. The range of pre- to post-treatment change scores for the TG, ACG, and WCG were -2 to 10 (M = 1.00), 1 to 9 (M =4.83), and -3 to 56 (M =2.00) respectively. When comparing the TG and ACG, again there were 42 potential pairs of participants who could be compared in terms of their change scores. Of these 42 potential pairs, nine pairs were correctly classified (21.43% PCC Index; c = 0.94). When comparing the TG and WCG, there are 21 potential pairs of participants. Of these 21 potential pairs, ten pairs were correctly classified (47.62% PCC Index; c =0.56). When comparing the ACG and WCG, there are 18 potential pairs of participants. Of these 18 potential pairs, 12 pairs were correctly classified (66.67% PCC Index; c = 0.28). The magnitude of change for each group is shown in Table 3 including the number of correct pairwise classifications, PCC Index; and c-value for the pairwise comparisons of each group.

The largest overall gains were again observed with the ACG and the smallest overall gains were observed in the WCG. Results, therefore, appear to suggest that the TG did not effectively decrease symptoms of anxiety more than the ACG; however, it seems to have been more effective than WCG. When the c-value was taken into account, it is very unlikely that the ACG results would have occurred by chance yet all other results do not appear to be very unique (see Table 2 and Table 3). Results will be further explained in the discussion section.

Self-Compassion

Changes in level of self-compassion measured with the SCS-SF are also shown in Table 2. Self-report scores from the SCS-SF did not match the predicted ordinal pattern as expected for the TG. Data were complete for the TG and included seven cases. Of the

seven pairs of observed pre- and post-treatment scores, one of the cases fit the expected ordinal pattern of increased level of self-compassion following treatment (14.29% PCC Index; c = .98). The range of pre- and post-treatment self-compassion scores for the TG was 1.37 to 3.08 (M =2.45) and 1.58 to 3.00 (M = 2.33) respectively.

Data for the ACG was complete and included six cases. Of the six pairs of observed pre- and post-treatment scores, five of the cases fit the expected ordinal pattern of increased level of self-compassion following treatment (83.33% PCC Index; c = 0.10). The range of pre- and post-treatment self-compassion scores for the ACG was 2.42 to 3.50 (M = 3.07) and 2.58 to 3.67 (M = 3.25) respectively.

Data for the WCG was also complete and included three cases. Of the three pairs of observed pre- and post-treatment scores, one of the cases fit the expected ordinal pattern of decreased anxiety symptoms following no treatment (66.67% PCC Index; c = 0.87). The range of pre- and post-treatment self-compassion scores for the WCG was 2.25 to 3.00 (M = 2.56) and 2.17 to 2.92 (M = 2.56) respectively.

Last, the hypothesized pattern of magnitude of change for each group (i.e. TG > ACG > WCG) did not match the actual ordinal pattern of change for pre- and post-self-compassion scores; however, the TG did appear to show a greater magnitude of change than the other two groups. The change scores from pre-treatment to post-treatment were again computed for each participant on each of the three measures and the variable change score was compared pairwise using the OOM software. The relative magnitudes of changes in self-compassion scores for each group were as follows: TG > WCG > ACG. The range of pre- to post-treatment change scores for the TG, ACG, and ACG were -2 to 10 (M = 1.00), 1 to 9 (M =4.83), and -3 to 56 (M =2.00) respectively. When

comparing the TG and ACG, again there were 42 potential pairs of participants who could be compared in terms of their change scores. Of these 42 potential pairs, 32 pairs were correctly classified (76.19% PCC Index; $c = 0.06$). When comparing the TG and WCG there are 21 potential pairs of participants. Of these 21 potential pairs, 16 pairs were correctly classified (76.19% PCC Index; $c = 0.13$). When comparing the ACG and WCG, there are 18 potential pairs of participants. Of these 18 potential pairs, four pairs were correctly classified (22.22% PCC Index; $c = 0.91$). The magnitude of change for each group is shown in Table 3 including the number of correct pairwise classifications, PCC Index, and *c*-value for the pairwise comparisons of each group.

The largest overall gains were observed with the TG and the smallest overall gains were observed in the ACG. Results, therefore, appear to suggest that the TG effectively increase level of self-compassion more than the ACG and seems to have been more effective than WCG. Further, the *c*-values appear to indicate that the ordinal paired scores for the TG are the only set of scores that are less likely to be due to random chance (see Table 2 and Table 3 in Appendix M). Results will be further explained in the discussion section.

Qualitative Data Analysis

Coding processes for this study followed recommendations for coding and theme development for phenomenological inquiry (Creswell, 2013; Saldaña, 2013). Initial coding took place during the data clean-up process and produced codes that seem to organize the data through a process of horizonilization where all data was of equal importance (Moustakas, 1994). Codes appeared to be related to similarity of data such as: sounds, weather, walking behavior, negative affect, or conversation. After initial

coding, researchers independently read through the data by type and continued to identify patterns. Researchers further began the process of lumping the significant statements together; however, this early lumping and categorization was simple and broad. A secondary coding process took place in which researchers independently read the data by participant to further identify patterns and trends of significance. The researchers met to discuss their codes and initial thoughts of themes and came to a consensus as to the nature and content of the four identified themes: *Expectations vs. Openness, Inner and Outer Contexts* – with sub-themes of *Heightened Awareness and Judgement of Self and Others*, *Coping Mechanisms*, and *Distress Tolerance.*

To answer research questions one through six, the researchers looked for participant statements that directly related to symptoms of depression and anxiety or to self-compassion in order to find ways to further explain participant experiences and eventually to connect these experiences to the quantitative data. To answer research questions seven and eight that seek to explore the essence of the phenomenon of walking a labyrinth as a complementary treatment, researchers compared experiences across groups to identify convergence and divergence. Textural and structural descriptions were constructed that described the "what" and the "how" of the participants' experiences. These descriptions were further refined to construct a statement of the essence of walking a labyrinth as a complementary treatment. The three qualitative researchers evaluated the truth of this essence and came to a consensus on the final statement (Moustakas, 1994; Saldaña, 2013).

Qualitative Data Results

Length of Walking Sessions

TG participants walked on average 9.19 circuits during the first half of each walk and 8.25 circuits during the second half of each walk for a total of 17.44 average circuits per walking session. Given that one circuit through The Morrill Hall Labyrinth is approximately 350 feet, TG participants walked on average approximately 2,802.95 feet (0.53 miles) in the first half of their walks and 2,516.25 feet (0.48 miles) in the second half of their walks. This means that the average walking session distance for the TG was approximately 5,319.20 feet (1.01 miles). One TG participant was not included in these results due to her atypical walking style. Brittany (pseudonyms are used for all participants) chose to walk through the labyrinth along the shortest path possible. Her walk was characteristic of a meandering style as she did not approach the benches in the labyrinth and instead chose to change course at each joint of the path. Due to her atypical walking style, Brittany completed a greater number of circuits during her sessions (first half average = 12.50, second half average = 10.56, average total circuits = 23.06) and it was impossible to determine the approximate length of her walking sessions. Figure 7, a picture of her walking pattern is located in Appendix N.

Surprisingly, the ACG's average walking sessions were very similar to the TG. ACG participants walked on average 5.36 circuits during the first half of their walking sessions and 4.60 circuits during the second half of their walking sessions for a total of 9.96 average circuits per walking session. Given that one circuit around The Library Lawn path is approximately 550 feet, ACG participants walked on average approximately 2.948 feet (0.56 miles) in the first half of their walking sessions and 2530 feet (0.48

miles) in the second half of their walks. The average walking session distance for the ACG was approximately 5,478 feet (1.04 miles).

Given that the ACG was asked to maintain a moderate walking pace, it was expected that their walking sessions would be longer on average than the mild walking in the TG. This result may indicate that the TG believed that a required intensity was required in order for the sessions to be considered "exercise." Blinding the true intent of the study by stating that it was an exercise study may have influenced the TG participants pace during their sessions. Further, both groups maintained a relatively even pace throughout their sessions, yet overall, participants slowed slightly during the second half of their walking sessions.

Expectations vs. Openness

Participants in all groups expressed some interest in the purpose of the study. The actual purpose of investigating the potential effectiveness of walking a labyrinth as a complementary treatment for depression and/or anxiety and group assignment was kept from participants in an effort to control for expectations related to labyrinths in particular. Blinding was suggested in the literature as a potential strategy to increase rigor and to control for participant expectations (Kinser & Robins, 2013).

Despite the attempt to control for expectations related to participant understanding of the purpose of a labyrinth, one participant in the TG had some prior knowledge of labyrinths that may have influenced her expectations for her sessions. Maddy stated that she "didn't have much expectations [for her labyrinth walk], but I did always think of labyrinth walks as intended for meditation or prayer." In fact, at the beginning of Maddy's second session, she asked if she could listen to something as she walked and her

journal entries documented that she listened to a religious radio show for three of her four sessions. It would appear that Maddy's understanding of the use of labyrinths influenced the context of her walk. Although there is no right or wrong way to walk a labyrinth, Maddy may have limited her experience by imposing a rule or expectation for meditation and prayer. Maddy's prior learning also influenced her ideas of what a labyrinth should be. "When I thought of labyrinths…this [labyrinth] isn't away or secluded at all so it's not as peaceful as perhaps it could be. I also didn't expect the mathy stuff behind it [the labyrinth] in the little explanation square [the starting block on the labyrinth floor that shares information about the design of the labyrinth and its relationship to the Fibonacci mathematical ratio.]." Here Maddy seems to be saying that she thought all labyrinths were located in peaceful locations and this labyrinth did not seem to fit her preconceived labyrinth prototype.

A participant in the ACG also reported prior expectations for participation that may have impacted her experience. Claire stated:

> I expected to have my heart-rate checked. I guess when I thought of "exercise" and "study" my mind just went to a physical checkup instead of a mental checkup. It was odd to me, the first week, that I never had my heart-rate measured before or after my walk.

This expectation seems to be rooted in the idea that exercise and wellness are related to cardiovascular fitness. This conceptualization is also a theme in the literature describing the effects of exercise on psychological wellness. Yet "…[E]motional benefits arise from the accumulation of acute mood improvement caused by the individual sessions of exercise." (p. 42, Salmon, 2001) - before there has been an opportunity for improved

cardiovascular fitness. It is possible that this expectation that wellness be attached to cardiovascular fitness may interfere with an individuals' feelings of self-efficacy and improved wellness following exercise or meditative movement activities. It is also possible that despite initial expectations for cardiovascular fitness, participants can let go of expectations and find benefits. When asked if her walking sessions met her expectations, Claire reported, "No, but not in a bad way. …Which was fine, just not what I expected."

Expectations for the setting also included participant reports about the impressions of the size

and structure of the walking spaces. Participants were both satisfied and dissatisfied with their walking spaces. Participants also remarked on the varied weather during their sessions with different appraisals; some enjoyed the weather and others wished for warmer or cooler.

Participants in the TG were mostly satisfied with their walking space. Maddy reported feeling that the space was "too small" and the turns "too tight." Jessica reported:

> [I]t felt like a puzzle almost. [T]he first time I got a little confused, but I got used to it and it made concentrating on my breath and walking easier. I would probably prefer to walk in a park of something with more nature, than feeling like [I] was walking in a puzzle.

The feeling of confusion was echoed by two other TG participants, Maddy and Brittany; however, all three participants stated that this confusion faded after about the third time through the labyrinth circuit and was gone altogether by the second treatment session. Most reported that the labyrinth was "relaxing" and

"calming" and the other four treatment participants all reported satisfaction with the walking space and their experiences; six of the seven participants found some satisfaction with their experience.

Three of the seven TG participants, Jessica; Erin; and Maria, reported having expectations for the walking sessions prior to beginning the study that may have impacted their experiences. Jessica stated, "I expected to feel a change in emotion after the 20 minute walk. I expected to feel happier and calmer." Erin reported, "I didn't have very high expectations. My goal was to just love myself enough to go and do the exercise. Also, I guess I expected to gain a better peace of mind for my anxiety and depression." Maria reported expecting to make money. All three participants with expectations reported that expectations were somewhat met. Jessica stated, "They were not fully met. A couple of the times, I felt a little bit better about myself or slightly calmer. But it did not help my depression significantly." Erin reported, "I feel like they were in some ways. I felt better mental and physically every time I walked. I think I definitely gained something from it..." Maria did in fact make money; however, she felt that the study took too long and she had hoped to make the money faster.

ACG participants shared this split satisfaction with the walking space. Elizabeth stated:

> The walk around the lawn was much longer than I expected. Since I don't usually lap around the lawn sidewalks, I never realized how big that space really is. The sidewalks around the lawn would make a great workout space for walking/running.

Claire reported, “For the most part I enjoyed the walk. I do get bored fairly easily, however, so I selfishly wish the route I had been asked to walk would have been bigger.” ACG participants were overall satisfied with their walks and the setting. Jill remarked, “The lawn was busy, but refreshing too.” Elizabeth stated that she “expected to walk away from each session feeling relieved of some stress and anxiety built during that day.” When asked if this prior expectation was met, she reported, “Yes, my walks felt peaceful and relaxing. During each session I was able to clear my cluttered mind and just enjoy the scenery.” Other than Elizabeth’s expectations for symptom relief and Claire’s expectation that researchers check her heart rate, the remaining participants reported no expectations.

For both the TG and ACG, those participants who reported no expectations prior to participation appeared to be more *open* to their experiences as a whole. This *openness* appears to have had an impact on their experiences in a positive way. Erin, in the TG, stated, “I think I definitely gained something from it and want to use it as a way of helping my anxiety and depression in the future.” Anne, also from the TG remarked, “I did not have any expectations because I was not sure what the research project was about or what information was being gathered.” Anne further commented, “I was satisfied with my labyrinth walking experience.” and Erin reported, “I was very satisfied with it.”

Hailey, a participant in the ACG, stated, “I really didn't know what to expect, just that I was going to get some exercise and help with research.” Yet, Hailey also reported satisfaction with her participation and when asked if her

expectations were met she replied, “Yes, plus some!” Finally, when Meagan, an ACG participant who reported having no expectations, was asked if she was satisfied with her walking sessions, she replied, “Definitely, and I have incorporated walking breaks in my daily life. While at work, I will sit at my office for about an hour and then I will schedule 10-15 min. walking breaks. This has improved my mood and work performance.”

Overall, participants in both the TG and ACG expressed satisfaction with their experiences. The majority of participants in both groups reported having no expectations prior to participation; however, for the few exceptions, prior expectations seemed to have influenced perceptions of the task, level of satisfaction with the experience, and the perceived outcome for participants from both groups.

Inner and Outer Contexts

The theme *Inner and Outer Contexts* applies to the context of the body versus the context of the environment. Participants in both treatment and ACGs reported observations of their inner body context and the outer environment. The two contexts appeared to be noticed separately; however, participants identified bi-directional relationships between them. It was as if participants were skilled at identifying stimulus-response relationships. This would seem to be consistent with the literature describing learned associations between anxious feelings and a perceived cause for those feelings. Individuals with high levels of baseline anxiety tend to be good at scanning for sources of their anxiety (Kroenke et al., 2007; Lépine, 2002). This skill may have influenced participants’ abilities to

connect what they felt in their bodies to the environment and their experiences during their sessions. Within this theme of *Inner and Outer Contexts*, two sub-themes emerged: *Heightened Awareness and Judgement of Self and Others.*

Heightened Awareness of Self

Participants in both groups appear to have experienced a *Heightened Awareness of Self* during their walking sessions. Interestingly a few participants commented that they were aware that their pace increased or decreased during their walks despite the fact that the researcher observed very few changes in pace. Further, the majority of the walking sessions contained a similar number of completed circuits in the first and second halves of the total walk, with a trend for slight slowing during the second half, which seemed to indicate that pace remained fairly consistent for most participants. Most of these participants reported that they sped up in response to outside stimuli such as being near another person on the path or they slowed down as their comfort increased or as sessions progressed. Maria, from the TG, reported that she thought she "was walking slower than usual." during her third session. She did, in fact, walk slightly slower. In her first two sessions, she completed 15.5 and 16 circuits through the labyrinth and during her third session, she completed 14.75 circuits. The difference between the three sessions seems relatively small, yet Maria noticed her slightly slower pace. Kayla, an ACG participant, stated, "I felt I was walking faster than I did the time before." She also reported, "I have noticed the faster I walk, the harder it is for me to focus on my breathing." Pace seems to

have been very noticeable to Kayla, yet her sessions were nearly identical in both length and number of circuits in the first and second halves of her walks.

Participants in both groups noticed body sensations beyond pace as well; however, the ACG seemed to have recorded more detail about their body contexts than the TG. The TG reported times when they were able to let go of thoughts or think less in general; therefore, it is unclear if there are fewer details about their body contexts because they experienced fewer thoughts while walking or if they were less focused on body context than the ACG participants. Erin, in the TG, remarked on pain in her right knee that changed as her sessions progressed. Erin was also aware of other body sensations. She remarked, "As soon as I got the first lap done, I noticed my breathing becoming more evenly paced as well as my heart rate. It seemed that near the end of the walking session that my breathing and heart rate became more in sync with my steps as I continue walking." Kayla, from the ACG reported, "I felt I was more self-aware in how I would react [in my body and pace] to the people around me." Finally, Meagan, also from the ACG, stated, "I focused my energy on the sound of my breath and various bodily sensations. For example, I realized that my shoulders were super tense and my right hand hurts because I clinch my fist throughout the day."

Both groups were asked to focus on their breath, but in different ways. The TG was simply asked to notice their breath, while the ACG was asked to maintain a moderate breathing intensity. This prompt seems to have influenced some of the body context focus for the participants in that nearly all participants wrote about their breath – the pace of the breath, the feeling of the breath,

noticing the breath, and so forth. For example, Maddy, from the TG reported, "I was told to think about breathing and I think this time it was easier breathing and only one time that I really noticed I had to stop and take a deep breath." Claire, from the ACG reported, "I felt like all my breaths were too shallow and started to breathe deeper and slower as a result."

Heightened Awareness was also seen in the participants' awareness of the environment or outer context. TG participants commented on noticing other people walking by, perceiving that people were looking at them, seeing and hearing birds in the labyrinth, feeling the temperature of the air or the flow of the wind. Participants in the ACG noticed similar outer contextual information and they also seemed to have documented more information about outer context. This may be due to the differences in purpose of the two locations. While both areas are places people travel through on the way to a myriad of destinations, the Library Lawn location (ACG) is more centrally located on campus and a larger number of people move through it on a daily basis. Further, there were specific activities in the Library Lawn area that ACG participants had the opportunity to experience such as Homecoming displays, people taking graduation photos, playing games, and other group activities. The group activities near the Morrill Hall Labyrinth were more locomotor in nature, such as ROTC groups walking by in uniform or people moving from one building to another.

In the TG, Erin stated, "I did notice an Asian girl sitting on one of the benches crying while on the phone with someone." She went on to describe watching this woman and wondering about her and the reasons she might be

crying. Maddy, also from the TG, reported *Heightened Awareness* of her surroundings during her third session, "…this is the first time I really noticed the patterns on the stones on the ground which was really neat to look at while walking." Maria, another TG participant, noticed "A lot of bugs flying around, cold winds." Maria was not the only person to mention the weather. About half of the participants in both groups noticed the weather at some point during their sessions. For example, Meagan, from the ACG, reported, "Today it was really warm outside and I enjoyed feeling the sun on my skin." Jill, also from the ACG reported being aware of activity during her walk, "The mid-day rush around the lawn was, however, chaotic." She also noted the absence of activity, "...mornings…to my enjoyment, the lawn was essentially empty." Claire provides another example of *Heightened Awareness* of *Outer Context* in her statement, "There was a lot to pay attention to…such as a mariachi band…some flags and flowers…"

Judgment of Self and Others

In addition to *Heightened Awareness* of *Inner and Outer Contexts*, a sub-theme was identified as *Judgement of Self and Others*. Given that participants were experiencing symptoms of depression and/or anxiety, it is not surprising that they would also provide information that would support harsh views of themselves and the world (Clasen et al., 2013; Kwan, Stevens, & Bryan, 2017). Participants in both groups noticed the people around them and wondered what they would say to friends and acquaintances that might walk by during a session. Participants in both groups wondered what the people around them might be

thinking. Perhaps most surprising; however, was the discrepancy between groups on this sub-theme. TG participants did not express nearly the number and variety of negative appraisals of the self and others as the ACG participants did. TG participants seemed to judge their ability to correctly navigate the labyrinth pattern and appeared to notice their level of physical fitness. When TG participants wondered about the thoughts of others, that seemed to be the extent of their thoughts - "wonder." Many ACG participants appeared to judge themselves and others consistently; some judged themselves and others severely. These participants did not simply "wonder" about the thoughts of others, they believed others were judging them harshly and constructed actually thoughts that others might be having. Participants who appeared higher in judgement also seemed to express more catastrophic thoughts (e.g. "Today's weather…is perfect for tornadoes."), worries of the treatment effects lasting (e.g. "…would [the effects of my walk] have longevity in the future, I certainly hope so."), and overall appeared to experience more negative affect (e.g. "…feeling of hating life."). This level of judgment was not true of all participants. In the TG, judgement was present for two of the seven participants and for the ACG it was present for five of the six participants.

Judgement of Self and Others was evident in statements such as Hailey's from her first ACG session:

> I was worried what people were going to think of me... My heart beat faster as I watched people walking past me, wondering what they might

> think of me walking in a circle…I felt like they were watching me, whispering about me, and judging me, wondering why I kept walking by.

Kayla, also in the ACG, remarked, "I felt this most recent walking exercise was less calming as compared to the first, I suspect this is due to multitude of people walking by…I think I experienced a little social anxiety at the time [while passing people.]" Claire echoes the social anxiety seemingly caused by worry of the judgement of others:

> Did other people think I was exercising? I didn't have my bag with me, so clearly I wasn't actually *going* anywhere [emphasis in the original]. Unless I just looked lost, which is possible. I tried to walk with more purpose than someone who was lost would, just in case.

Jill, too, seems to capture the emotional distress related to *Judgment of Self and Others* in her statement, "So many people moving around, moving yet likely not moving in circles as I was. So many eyes." Evidence of overwhelming worry of judgment from others was seemingly missing from the TG. It may have been present, but did not appear to be something the TG participants focused on or documented. One potential example of *Judgment of Self and Others* was documented by Jessica in her statement, "Although I had this music on, I was still unable to feel better due to the distractions and the people around me."

Judgement of Self continued for both groups, however. Maddy, from the TG commented that her walk, "Made [her] feel out of shape." Participants in this group also seemed to wonder at their ability to figure out the labyrinth pattern. However, typically by the third circuit through the labyrinth, all participants expressed quick acclimation and increased self-efficacy. The ACG experienced

more self-judgment by comparison. Claire, for example, reported, "…I noticed that my shoes were loose and realized I had forgotten to tie them tightly before we started…brainless mistake." In a later session, she also stated:

> …started to sweat while walking. I could have taken my taken my jacket off, but…I didn't want to carry it around while I walked or tied it around my waist (because I think that looks stupid and I have my pride).

Claire was also one of the ACG participants who seemed to harshly *judge not just herself, but others* as well. For example, she remarked, "…another woman casually strolled by while playing a ukulele (what an attention seeker)."

Coping Mechanisms

Participants in both groups identified ways that they *coped* with symptoms and discomfort which led researchers to identify a theme of *Coping Mechanisms*. Differences from the first to second session for all participants appeared to be in some way connected to problem solving. Most participants identified *Coping Mechanisms* they had used before participation such as counting or distraction. For example, by the second session, five of the seven TG participants and two of the ACG participants had chosen to listen to music, podcasts, and radio programs. These participants reported finding this added activity soothing. Jessica chose to listen to music and reported, "I turned on a playlist that was soothing and usually helps me calm down." After Aubry's second treatment session, she stated, "This time I was listening to a podcast. I like this… because it was easier to not think about anything else." Jessica, Brittany, and Aubry were all members of the TG. Meagan, in the ACG, chose to "connect with [an] old friend…" and "read on [her]

phone." Elizabeth reported, "The first two walking session[s] consisted of me counting the laps I walked each time." and she was not alone. Several participants in both groups counted their "laps" throughout their sessions.

Jill, a participant in the ACG stated, "Honestly, I have always used exercise as a conscious means to relieve stress and anxiety. Recently though, a fear of the fear of the pain (in regards to my anxiety-induced chest pain) has prevented me from doing this." She went on to say that as a result of her experiences in this study, she is more confident in the idea that exercise can be fun again. She reported that her walking sessions were "enjoyable" and she experienced "clarity and no panic." Jill also reported being worried about generalizing these positive experiences to her real life, yet it would seem that she is beginning to consider reincorporating a previously effective *Coping Mechanism* - exercise. Meagan, also from the ACG, also reported recognizing that she had abandoned an old *Coping Mechanism*. After her first ACG session, she stated, "I realized that I spend a lot of my time inside of my office. I really want to make a goal to go outside more and connect with others." At the conclusion of the study, Meagan went on to report, "I now take time out my day to walk around campus, give myself a mental break, meet with people who lift my mood and just do a self-care activity for me."

In addition to using and renewing commitment to old *Coping Mechanisms*, participants in both groups developed new *Coping Mechanisms*. Participants in both groups identified focusing on their breath or their bodies working as a *new mechanism* that worked for them. Hailey, in the ACG reported,

"I learned to focus on my muscles pulling me forward, instead of worrying about what other people were thinking of me. I [now] use this every day walking to and from class." Erin, from the TG, stated, "This time I had very little to no anxiety. My breathing was more paced from what I could tell and overall, I just enjoyed the exercise." Three of the seven treatment participants and four of the six ACG participants found the walking itself to be therapeutic and indicated that they intend to incorporate future twenty minute labyrinth and lawn walks into their daily routine. Elizabeth even reported, "This could be the starting step to introducing exercise to my family."

Other new *Coping Mechanisms* gained during the course of the study included characteristics of the study design. One TG participant, Maddy, stated, "[I] think that [my symptom relief] may have more to do with being a participant in a study than the actual act of walking. [A]t one point, as [I] noted in my journal, the journaling aspect of participating in these sessions helped me out with this [feeling better]." Many participants from both groups reported that the act of scheduling a structured time, in a particular space, for a set duration felt very doable – something they could and want to continue. These participants found their walks to be "a break" from the stress of their daily lives, a break from thoughts of to-do lists and the expectations of others, and a break to get in touch with themselves and engage in self-care. Further, participants from both groups stated that these "little walks" showed them that they could find the time to add exercise to their lives, "not just to become physically stronger, but mentally stronger as well."

Interestingly, unique *Coping Mechanisms* appeared to develop for two participants. Erin, in the TG, had a moment of observing a woman sitting on a bench inside the labyrinth who was talking on the phone and crying. Her report of her observations of this woman seemed to indicate that she felt empathy for this woman and this empathic focus on someone else helped to take her mind off of herself. It was during this session that she reported that her knee no longer hurt and she "felt happy" and "confident." Elizabeth, from the ACG, journaled about her experiences waxing nostalgia. She watched high school juniors tour campus and thought of her own time as a high school junior. In another session, she enjoyed the smiles on the faces of the graduates having their pictures taken and thought of their smiles - a sign of a sense of accomplishment - as her own smile. She stated, "I needed to see these graduates because it reminded me that one day all this stress and anxiety will be worth it."

Finally, two participants, one in the TG and one in the ACG chose to engage in individual therapy during the course of their time in the study. Both attributed this new *Coping Mechanism* to an aspect of the study. One of two participants who disclosed during the course of the study that they experienced suicidal ideation chose to begin therapy at a counseling center that was on a list of resources provided to her by the researcher shortly after her third research session. Another participant remarked, "The routine and the responsibility of scheduling sessions helped me realize the necessity of consciously taking time to care for my mental health. As a direct follow-up to this process, I am now planning to begin counseling."

Distress Tolerance

Finally, many participants from both groups documented changes that seem to indicate that their level of *Distress Tolerance* increased over the course of their session. *Distress tolerance* is, therefore the last theme, identified from the qualitative data. Erin, from the TG, reported pain in her right knee during her first session that lessened during her second session, and seemed to be gone altogether by the third. Many participants reported increased tolerance of extreme heat or cold from session to session. Some reported increased tolerance of the passage of time. Elizabeth, for example, reported that the first ACG session, "…seemed to take forever." Yet, by her third session, she stated, "On this walk I realized that 20 minutes out of my whole, entire day actually isn't a lot of time." Meagan, also from the ACG, reported, "There were time[s] that I felt so stressed from the day that I would want to fall apart and cry. But after every session I felt better. No, my problems did go away but I noticed that I didn't have such a strong reaction to them." This statement seems to be the epitome of increased *Distress Tolerance*. Meagan's problems were not gone, but they somehow seemed more manageable.

Not all participants experienced increased *Distress Tolerance*, a few seemed to maintain the same level of distress throughout their sessions. Two participants, Claire and Jessica, seemed to document consistent distress related to their lives and to the walking experiences. They each also reported symptom reduction and pleasant things about their experiences; however, their language describing their experiences seemed to belie these results and instead convey evidence of little change in *Distress Tolerance.* For example, Jessica, from the

TG, reported that her symptoms were "…not significantly better, but it [the walk] helped for a little bit." after session one. By session two, she stated that she "…had returned to [her] normal symptoms." By session three, Jessica reported, "…constant worrying made it impossible for me to feel better after the 20 minute walk." Only one person seemed to report a feeling of decreased *Distress Tolerance.* Maria from the TG seemed to find that her affect and ability to tolerate her sessions was related to how the rest of her week had gone and how much she had on her mind. She seemed unable to disengage from her daily life during her sessions and appeared to experience a fairly high level of distress throughout the duration of the study. Further consideration of potential explanations for these results will take place in the discussion section.

CHAPTER IV

DISCUSSION

The convergent independent mixed methods designed used for this study allowed for the opportunity to simultaneously collect quantitative and qualitative data in an effort to combine testing the hypotheses, answering the research questions, and describing the phenomenon of walking a labyrinth as a complementary treatment for depression and/or anxiety (see Figure 8 found in Appendix O). Ordinal pattern analysis using the OOM procedure showed that only one of the three groups demonstrated any observable, unique signs of the predicted ordinal direction of intervention success and only one of the three groups demonstrated any observable, unique signs of the predicted ordinal magnitude of intervention success. The ACG, who completed traditional walking exercise around a rectangular section of lawn in a busy, central location on campus contained the largest number of individuals who demonstrated a decrease in anxiety symptoms and this ordinal pattern of decreases was not happenstance (100% PCC Index; *c*-value = 0.02). These

results were supported by the qualitative reports of the six ACG participants. Next, the TG had the highest ordinal magnitude of increased self-compassion when pairs of self-compassion change scores were compared to the change scores of the other groups. The magnitude of change in self-compassion for the TG was largest when compared to the ACG and was also not likely to have occurred by chance (76.19% PCC Index; *c*-value = 0.04). Despite the fact that OOM analysis did not show unique overall observed ordinal patterns of change on all variables for the TG participants or for the ACG, some participants in both these groups reported decreased anxiety and depressive symptoms and increased self-compassion qualitatively. Further, qualitative analysis of the TG participants' experience showed some very positive results that were inconsistent with the quantitative pattern of scores. These inconsistencies and the lack of unique OOM results may be explained by the characteristics of the pre-treatment scores for participants in all groups. As mentioned in the literature review, previous research suggested that floor effects may impact participants results (Salmon, 2001). In this study this may mean that many participants who demonstrated no or very few symptoms prior to treatment may have shown no quantitative decrease in symptoms; however, they qualitatively reported they felt better post-treatment (Salmon, 2001). Depression and anxiety symptom severity and level of self-compassion as indicated by the measure cut-scores are shown in Table 4, found in Appendix P.

Participants in the TG showed no unique OOM results that indicated intervention effectiveness beyond the fact that this group demonstrated the greatest increase in self-compassion pre- to post-treatment. This increase in self-compassion occurred despite the fact that as a group, the majority of the TG participants' scores did not meet the overall

expected pattern of change (i.e. pre- < post-scores). Individual scores may explain this finding in that one participant in the TG experienced an increased self-compassion change score of .42 from pre- to post-treatment, a relatively large increase given that the overall range of scores for the SCS-SF is 1 to 6. Standardized measures did not support the hypotheses that stated that walking a labyrinth will reduce symptoms of anxiety and depression and raising levels of self-compassion nor did they support the hypotheses that walking a labyrinth would reduce symptoms of anxiety and depression and increase level of self-compassion better than either the ACG or WCG. Qualitative data, however, along the four identified themes suggested that several TG participants did, in fact, feel better following treatment and were satisfied with the treatment experience. Additionally, the ACG intervention proved to be the most effective intervention both through OOM pattern analysis and as suggested by the qualitative themes. Most notably, all ACG participants saw some decrease in symptoms of anxiety from pre- to post-treatment and three ACG participants saw large decreases in symptoms of anxiety from pre- to post-treatment, ranging from 7 to 9 points difference with a total score range of 0 to 21. Finally, as expected, the WCG experienced the least amount of symptom reduction and increased self-compassion of any group; however, WCG participants did see some improvement without treatment.

It is quite possible to infer explanations of the outcomes of the interventions. Qualitative differences among participants and groups may have played a role in the success of the ACG. The ACG participants demonstrated overall lower levels of depression than the other two groups and higher levels of anxiety. As a group, the ACG participants also had higher base-line levels of self-compassion than the other two

groups. Further, the TG appeared to include two participants with the highest levels of symptomology and the only two participants who reported active suicidal ideation. In addition to the aforementioned potential floor effects, these group characteristics likely influenced outcomes; however, just how can only be speculated.

Had this study only used quantitative measures, it seems that very little valuable information would have been obtained. The depth and richness of the qualitative data, not only helped to explain quantitative outcomes, it also provided additional information about treatment effectiveness that would have otherwise been missed. When participants were asked to reflect on their experiences, four themes emerged: *Expectations vs. Openness, Inner and Outer Contexts* – with sub-themes of *Heightened Awareness and Judgement of Self and others, Coping Mechanisms*, and *Distress Tolerance*. *Expectations vs. Openness* as a theme, suggested that the participants varied within and between groups on their preconceived notions about the study. Participants who seemed to have expectations that the study reduce symptoms dramatically also seem to have been the most disappointed by treatment outcomes. In particular, two participants in the TG who experienced high levels of depression reported high expectations for treatment success that were not met.

This result may be explained by the effects of anxiety and depression on cognitive appraisal. Individuals experiencing depression often have distortions that can affect cognition and appraisal (Clasen, Disner, & Beevers, 2013). Individuals who experience depression also appear to have an interpretation bias that leads them to pay attention to information that confirms their bias toward negative information and negative affect can influence perception (Clasen et al., 2013; Kwan, Stevens, & Bryan, 2017). Further,

distorted expectations can influence future perception of reward and lead to reduced sensitivity to rewards. Individuals who experience depression, in particular, may have unrealistic expectations for treatment that are coupled with distorted expected rewards (i.e. very large gains acquired quickly) and these distorted cognitions may in turn foster lowered feelings of self-efficacy, ideas that treatment is a failure, and influence attrition (Clasen et al., 2013; Kwan, Stevens, & Bryan, 2017; Rogers et al., 2010; Tran et al., 2015). In the case of the participants in this study, severely depressed participants may have perceived the treatment as a failure due to unrealistic expectations from the outset that set them up to believe that the treatment, and perhaps they, themselves, fell short. Evidence supporting this explanation can be found in behaviors documented in Jessica's journal entries. In addition to having high expectations for the treatment to relieve her symptoms, Jessica reported that she began taking an SSRI anti-depressant at the time of the first session. She then reported that she stopped taking this SSRI by the second session, just one week later, because her symptoms appeared to get worse instead of better. If this timeline is accurate, it appears that Jessica put great faith in this medication as a potential panacea that would work quickly and dramatically. When those results were not realized, Jessica may have decided to stop taking the medication, seeing it as a failed intervention. If the cognitive distortions-due-to-depression suggestion is accurate, it can be considered a success that all individuals experiencing moderate to severe depression completed their sessions during this study rather than prematurely dropping out.

Furthermore, MM research to-date has focused on subclinical levels of pathology in part due to the fact that it is believed that the intensity of treatment must be matched to

the severity of symptoms (Oh et al., 2013; Payne & Crane-Godreau, 2013). Because clinical levels of anxiety and depression likely require more intense levels and variety of intervention, participants experiencing more severe levels of depression and/or anxiety may not have experienced success from walking a labyrinth as a treatment. That said, this potential explanation does not invalidate walking a labyrinth as a complementary treatment. Dr. Herbert Benson, the Harvard psychologist credited with the discovery of the relaxation response, stated that meditation (seated or meditative movement) should be added to daily life in the same way that brushing one's teeth is a part of daily life. He stated that this intention is to include meditation as a part of regular routine that is not judged as good or bad, but simply done (Hanna & Benson, 2017). Too extend this tooth brushing and meditation analogy, it is possible that walking a labyrinth may be used as a daily routine mental health maintenance activity. It may not completely alleviate severe symptoms, but it is possible that it may prevent new symptoms and keep existing symptoms from getting worse in much the same way that tooth brushing prevents new cavities and helps to keep existing cavities from worsening. To address severe dental issues that are not remedied by tooth brushing, individuals seek professional dental care, yet they still maintain daily brushing. To address severe mental health issues, it makes sense that individuals need to seek professional mental health care, yet may still maintain daily MM such as walking a labyrinth. Therefore, individuals who experience severe depression and/or anxiety may find the labyrinth MM useful in maintaining gains or as a prevention tool, yet it would be unlikely that they would move toward remission of symptoms from this type of treatment. This does not invalidate the labyrinth as a useful MM tool as it was intended to be a complement to usual care, not to replace it.

Another possible interpretation of the results of the *Expectations vs. Openness* theme may be connected to MM and to the level of openness to experience. Much like the Buddhist walking meditation, walkers in a labyrinth are typically encouraged to let go of expectations for their walk and experience whatever comes to them during the walk without trying to will the experience away. Walking in the labyrinth encourages acceptance of all emotions and feelings, openness to experience, and trust in the process (Sandor, 2005). In order to identify a baseline for labyrinth treatment and limit influences on participant expectations, the researcher attempted to provide as little instruction as possible prior to each session. Artress (2006) believes that mindfulness begins the moment that an individual steps into the labyrinth; that this mindful, goalless state is achieved simply by walking the path. If the results of this study are accurate – and they are expected to be for the individuals who participated in this study – it would seem that either the non-traditional labyrinth used for this study did not invoke the same mindful, goalless, letting-go-of-expectations type walk that a more traditional labyrinth may have induced. The participants in the TG may not have found that the pattern of this unique labyrinth produced the same MM processes that would have otherwise been experienced in a traditional 20 minute labyrinth walk. Even so, many participants in the TG reported being able to let go of thoughts, several reported having no expectations, and while some initially expressed confusion or dislike for the walking pattern, this confusion and dislike tended to dissipate rather quickly.

In addition, openness to experience has been shown to be a pillar of Acceptance and Commitment Therapy. Openness refers to the ability to sit with all experiences without willing them away. The individual does not attempt to control experiences in

order to avoid distress and the individual pays attention to actual experiences rather than supposed rules for experiences (e.g. shoulds; Strosahl, Robinson, & Gustsavsson, 2012). Many participants in both the TG and the ACG appeared to lack openness. Lack of openness was evident in the way that most of the participants problem-solved ways to relieve their distress, boredom, and intolerance following the first sessions. Further evidence of the lack of openness to experience can be found in the rules participants placed on themselves during their walks. Participants from both groups seemed to think there was a "right" way to experience the walks. They worried about walking wrong, upsetting the researcher, and ruining the study by doing very natural things such as talking to a person they know, tying shoes tighter, or sitting on a bench to take a break. Some participants even seemed willing to experience discomfort and pain in order to follow these rules. Yet others applied fewer rules – they talked to whomever they wanted to talk to, adjusted their clothing as needed, and bounced down the stairs or along the path. Those who experienced this openness to the experience not only reported greater satisfaction and increased joy during their walks, they also showed greater gains in symptom reduction than their counterparts. Interestingly, many of these open participants also showed higher pre- and post-treatment scores on the measure of self-compassion. The participants who were open to their experiences were found in both the TG and ACG.

The theme *Inner and Outer Contexts: Heightened Awareness and Judgement of Self and Others* was characterized by increased awareness of body and environment contexts and high judgement of the self and others. Increased awareness of the self

appeared to be useful in increasing satisfaction with the TG and ACG and in participant perception of reduced symptoms.

Two participants in the ACG used the word "mindfulness" to describe their increased awareness. Mindfulness is the opposite of taking life for granted (Kabat-Zin, 1994). "Mindfulness approaches are not considered relaxation or mood management techniques; however, but rather a form of *mental training* to reduce cognitive vulnerability to reactive modes of mind that might otherwise heighten stress and emotional distress or that may otherwise perpetuate psychopathology." (p. 231, Bishop et al., 2004; emphasis in the original). Bishop et al. (2004) offer a two component model for mindfulness that incorporates (a) "…self-regulation of attention so that it is maintained on the immediate experience, thereby allowing for increased recognition of mental events in the present moment." or sustained attention and (b) "…adopting a particular orientation toward one's experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance." with the flexibility to bring attention back to a breath once a thought, feeling, or sensation has been acknowledged without judgment - or openness with attentional switching (p. 232). Given this definition of mindfulness and the anticipated benefits of mindful behavior, it seemed that participants who experienced increased awareness, may have, in fact, been more mindful and this mindful stance may have helped to reduce their symptomology. More participants in the ACG reported mindful awareness without judgment and this may in part explain why the ACG experienced greater gains than the TG.

The sub-theme *Judgment of the Self and Others* may potentially be an opposite stance to mindful increased awareness and is certainly the opposite of a self-

compassionate perspective. With judgment, there may be heightened awareness; however, the harsh judgment and criticism of the self and others is damaging. Just as depression offers a distorted view of the self and the world, so does anxiety. Individuals who experience anxiety tend to carry with them an interpretation bias that often leads them to interpret ambiguous stimuli as threatening (Morrison et al., 2013). Combined, threat avoidance and rumination of ways to avoid fear and sadness may lead to distorted cognitions that continue the cycle of attentional bias and threat avoidance unendingly. This continuous cycle serves to both prolong the anxious and/or depressed states and continue to reinforce the confirmation bias for both of these disorders (Clasen et al., 2013; Morrison et al., 2013).

Further, self-criticism/self-judgment may lead toward disengagement and avoidance (Barnard & Curry, 2011; Gilbert & Proctor, 2006; Neff, 2009; Neff & Vonk, 2009). Once again, this harsh judgment of the self and others could have led to attrition, yet the participants in both the TG and ACGs completed their session. When looking over the qualitative data from session one to session four, it became apparent that some of the modest gains perceived by the TG may be connected to decreased judgement of self and others and increased feelings of self-efficacy, empathy, and self-compassion. Interestingly, this decreased self-judgment may also be a sign of decreased depressive symptoms. These suggestions may hold true for the ACG as well and may have been further enhanced by this group's characteristically higher levels of pre- and post-treatment self-compassion. In addition, the large increase in self-compassion seen in the aforementioned individual TG participant was perhaps possible due to the fact that her pre-treatment level of self-compassion was so low. Across the board, many TG

participants demonstrated low levels of pre-treatment self-compassion (n = 4) while the ACG group demonstrated moderate levels of pre-treatment self-compassion, (low self-compassion, n = 1). In contrast, none of the TG participants exhibited high levels of pre-treatment self-compassion and two of the ACG participants exhibited high levels of pre-treatment self-compassion. This result is consistent with the MM literature describing the influence of self-esteem on symptom reduction (Payne & Crane-Godreau, 2013; Shin et al., 2013; Chow & Tsang, 2007; WHO, 2001). It has been hypothesized that the measure of self-esteem actually includes the construct of self-compassion. Further, self-compassion is seen as a more positive and potentially more useful construct and the results from this study seem to point toward self-compassion as either a potential ingredient in the mechanism recipe behind MM or as a sign of decreased depression (Neff & Vonk, 2009).

The *Coping Mechanisms* theme appears to explain the maintenance of successful symptom management skills already in place, the renewal of attention to prior symptom management skills that had been dropped off for a period of time, or the addition of new strategies that participants perceived to be effective and desired to continue beyond the end of this study. Connecting this theme to the OOM ordinal pattern results, it becomes evident that many of the gains by the ACG for reduction of anxiety symptoms may have been related to this theme. Coping mechanisms designed to reduce suffering were used by nearly every participant and in particular by those experiencing anxiety. While depressive symptoms can be all encompassing and constant, the physiological responses to anxiety can be immediately distressing and even debilitating. It would stand to reason that participants suffering from anxiety might first target the immediate physiological and

cognitive symptoms experienced in vivo. Participants in both groups reported successfully decreasing anxiety symptoms during their walks by using a variety of coping mechanisms.

Among the participants who made a conscious effort to engage in coping mechanisms during their sessions, one participant engaged in a unique form of coping – waxing nostalgia. Elizabeth's report of watching people near her and thinking of her past experiences seemed to instill hope for the present and the future. Waxing nostalgia has been shown to be an effective buffer against symptoms of anxiety and depression and Elizabeth's symptom reduction may have been connected to her ability to recall her own memories of events that seemed similar to those around her (Sedikides, Wildschut, Arndt, & Routledge, 2008). In addition, this nostalgic waxing allowed for an increased connection to humanity which is found to increase level of self-compassion by decreasing feelings of isolation (Neff, 2009).

Several participants in both groups reported that they planned to continue their walks and the use of their *Coping Mechanisms* beyond the end of this study. Participants stated that they planned to engage in exercise, focus on their bodies and their breath, listen to relaxing music and radio programs, and make more time for themselves and self-care. One of the hopeful contributions of this study was to decrease the stigma associated with mental health treatment by providing evidence in support of labyrinths as a complementary treatment that is free, simple, and available to the general public regardless of age or ability. A few participants from both the TG and the ACG reported an increased awareness of the need for attending to their mental health and they chose a variety of strategies for doing so. Some stated that they had not previously considered

exercise as a potential mental health treatment and a few reported that they were surprised at how much their mood improved from an exercise that is so simple. Perhaps one of the most encouraging outcomes from this study is the fact that one TG and one ACG participant chose to engage in therapy as a result of participation. It would seem that the stigma related to mental health treatment was reduced for some of the participants. This qualitative report matches the experiences of the ACG participants the best; however, participants in the TG also stated future commitment to ongoing attention to their mental health.

Distress Tolerance as a theme describes the ability to experience and tolerate inner distressing events. Participants in both the TG and ACGs reported experiencing increased distress tolerance. They reported decreases in perception of physical pain, the ability to breathe easier, and perhaps most relevant to the results of the OOM analysis, increased ability to sit with discomfort in social situations. Many of the participants expressed levels of social anxiety; however, the prevalence of social anxiety symptoms was highest for the ACG. Two ACG participants even stated that they had social anxiety or were actively experiencing social anxiety during their sessions. Their symptoms ranged from negatively presuming what others were thinking about them to physiological sensations, such as a racing heart, when in close proximity to large groups of people.

The participants in the ACG who documented their experiences with social anxiety reported high levels of distress and active attempts to decrease this distress. They did not avoid sessions; however, and this engagement in the walking session activity may have impacted their overall perceptions of lower symptoms of anxiety. ACG participants described using distraction tools and perhaps most interestingly, they described their

process of accepting the fact that they would be around people and the realization that their actual experiences did not support some of their beliefs about other people. This process may have been similar to flooding or intense in vivo exposure in which participants are exposed to overwhelming stimuli until they begin to habituate. It is also possible that the simple acceptance of their fate – the fact that in order to participate, they had to walk among people – helped reduce symptoms of anxiety to a more tolerable level.

The data also suggested that those participants who did not experience increased *tolerance to distress* and discomfort did not achieve the level of symptom reduction they hoped for. In fact, some of the TG participants who reported discomfort and dissatisfaction of some kind at each session, actually saw symptoms of depression and/ or anxiety increase from session one to session four. Finally, there appears to be a trend throughout the data for the TG and ACGs: those who seem to have consciously made an effort in their sessions, appeared to experience some decrease in depression and/or anxiety symptoms and some increase in level of self-compassion.

In conclusion, the essence of the participants' experience of walking the Morrill Hall Labyrinth appears be characterized by initial confusion and self-doubt that begins to dissipate by the third circuit of the first walking session. Participants then seem to find that their self-confidence increases with each step as they feel more comfortable with the pattern that eventually becomes a routine break from daily stressors. Participants reported that they found the labyrinth to be relaxing and peaceful; however, some seemed to wish that the path was longer and that there were fewer tight turns. Overall, participants seemed to find the labyrinth walk to be a pleasant experience that was easier

than they expected. They stated that the labyrinth seemed to be a rhythmic way to reduce their stress and anxiety, let go off thoughts, and engage in self-care.

CHAPTER V

CONCLUSION

At first glance, it would seem that this study did not demonstrate that labyrinths may be an effective form of MM that can be used as a complementary treatment for depression and/or anxiety symptoms. However, the qualitative data and unique findings from the OOM analysis show that the TG group did make gains and perhaps more importantly, found their sessions to be an enjoyable break from the stress of daily life. The ACG appeared to have out-performed the TG on all variables and this result is not surprising as traditional exercise has already been established as an effective behavioral complementary treatment for psychological distress (Chow & Tsang, 2007; Craft, 2005; Prakhinkit et al., 2014; Salmon, 2001). In addition to testing the aforementioned hypotheses, this study sought to find an easily accessible complementary treatment that might help to reduce the stigma associated with mental health treatment. It would seem that the labyrinth does in fact have the potential to be a MM that can help to ease

symptoms of depression and/or anxiety and that the mechanism behind improvements may be related to level of self-compassion. Participants' increased their attention to mental health and the intention by some to continue their walks beyond the session or to engage in other forms of activity that contribute to psychological wellness also suggested that participants did not see walking a labyrinth as a stigma-producing treatment. Despite the potentially encouraging interpretation of this study's data, more investigation is warranted to conclusively claim that MM in a labyrinth is an effective complementary mental health treatment.

Limitations

The largest limitations of this study may be the inclusion of only female college students on one campus and the resulting small sample size. This limitation impacts generalization of results as the participants do not reflect the general population as a whole and restricted the use of traditional statistical analysis (i.e. MANOVA). The goal of this study, however, was to begin to explore the usefulness and effectiveness of labyrinths as a complementary MM treatment. Therefore, conclusive results that are generalizable to everyone may be a goal of future study. In addition, the sample size did not affect the qualitative analysis as a desired sample size for phenomenological inquiry is 5 to 25 and that objective was met for the TG and the ACG (Polkinghorne, 1989). Despite the fact that there was no restriction based on gender, only females participated. One male contacted the researcher, but was unable to participate due to his inability to regularly access the intervention locations. In addition, the study was limited to a set time frame due to the nature of a dissertation schedule. The time limitation may have impacted sample size and influenced the actual data as well. This study also relied

heavily on self-report which likely introduced bias. Future studies may wish to include caregiver and clinician reports of symptom changes in order to reduce bias and the likelihood of error to due to reporting styles and biased perceptions of self. Finally, it was possible that participants were influenced by the researcher; however, steps were taken to ensure similarity of researcher contact time and communication for all groups.

Implications

The results of this study are expected to fill several gaps in the literature. Much has been written about the use of labyrinths, yet most of this literature is anecdotal. This study was designed to apply organized scientific study to the use of labyrinths and to try to increase scientific rigor as rigor is often criticized in mind-body therapy studies (Kinser & Robin, 2013). Next, the study of labyrinths as a form of MM satisfied a request in the literature to identify additional forms of MM (Payne & Crane-Godreau, 2013; Sandor & Froman, 2006). Finally, the mechanisms behind MM are not conclusively defined (Chow & Tsang, 2007). Several studies have suggested that self-esteem may be a potential factor in the success of MM (Payne & Crane-Godreau, 2013; Shin et al., 2013; Chow & Tsang, 2007; WHO, 2001). Self-compassion as compared to self-esteem may be a more useful construct to consider; therefore, this study opted to include a measure of self-compassion to contribute to the understanding of the potential influential factors or mechanisms of self-compassion (Neff & Vonk, 2009).

In addition, the current study intended to deepen understanding of the experience of walking a labyrinth through the use of phenomenological inquiry. It is hoped that this deeper understanding will help to increase attention to the use of labyrinths and provide information that increases the use of labyrinths in the general population. It is also hoped

that the information included in this study will help Counseling Psychologists and other providers recognize the potential usefulness of labyrinths as a complementary treatment. Finally, this study is intended to better inform application and future study of labyrinths as a form of MM and as a complementary treatment for depression and/or anxiety.

Future Directions

The current study was designed to create a baseline for future study. The organized study of the experience and benefits of walking a labyrinth is largely missing from the literature. Much of the available information about labyrinths is anecdotal and speculative at best. It is hoped that future work may build off the results of this study. It will be useful to replicate this study using a traditional labyrinth pattern in order to determine if the outcomes were affected by the unique pattern of The Morrill Hall Labyrinth. In addition, it may be helpful to understand personal preferences for labyrinth patterns; therefore, replicating with several different labyrinth patterns may be important.

It will also be important to begin to determine dosage of labyrinths as a complementary treatment both independently and in conjunction with particular ongoing psychological treatments. For example, examining frequency and duration of treatment will better inform treatment options. Individuals could also be assigned to groups based on types of current treatments or based on symptom severity in order to determine the best combination of complementary treatment and usual care.

Additionally, MM literature suggested that MM is most effective when paired with training. Future study investigating differences among groups who engage in mindfulness or self-compassion training prior to sessions will be useful to see if training impacts the degree of symptom reduction. MM literature also suggested that mastery is

necessary for optimum results and that MM incorporated as a lifelong activity also produced better outcomes (Craft, 2005; Chow & Tsang, 2007; Gilpin, 2008; Payne & Crane-Godreau, 2013; Salmon, 2001; Sandor & Froman, 2006; Steptoe & Cox, 1988; Ströhle, 2009). Therefore, longitudinal study may be warranted to better understand the impact of mastery and practice. A final connection to extended MM study may be to explore outcomes related to social connection. Several MM studies have reported that better outcomes were achieved when participants had the opportunity to engage in social MM; however, the self-compassion and nostalgia literature suggested that connection to humanity does not have to be dependent on physical connection and can instead be attached to thoughts about connection (Neff, 2009; Payne & Crane-Godreau, 2013; Sedikides, Wildschut, Arndt, & Routledge, 2008). It will be helpful to explore solitary labyrinth walking and group labyrinth walking to explore the need for social connection.

Next, the current study focused on walking a labyrinth as a complementary treatment; however, there are many ways to experience a labyrinth. Future study of a variety of modalities will be useful in better understanding the mechanisms behind labyrinth experiences. For example, study of the effects of finger labyrinths, tracking labyrinths with the eyes, riding a trike or bicycle in a labyrinth, or using assistive technology to navigate the labyrinth (i.e. wheelchairs, scooters, computer cursors, etc.) may help find other ways to achieve results when walking is not possible. Finally, replication of study with a variety of populations will help to add credibility to the study of labyrinths as a complementary treatment and will provide deeper understand of personal preferences based on participant characteristics. In particular, as stated in the

literature, it may be very useful to determine the effects of MM in a labyrinth on symptoms within clinical populations.

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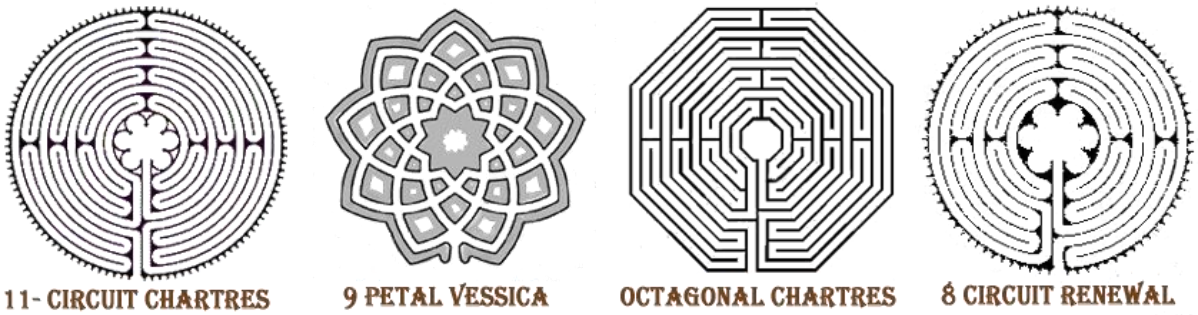
APPENDICES

Appendix A

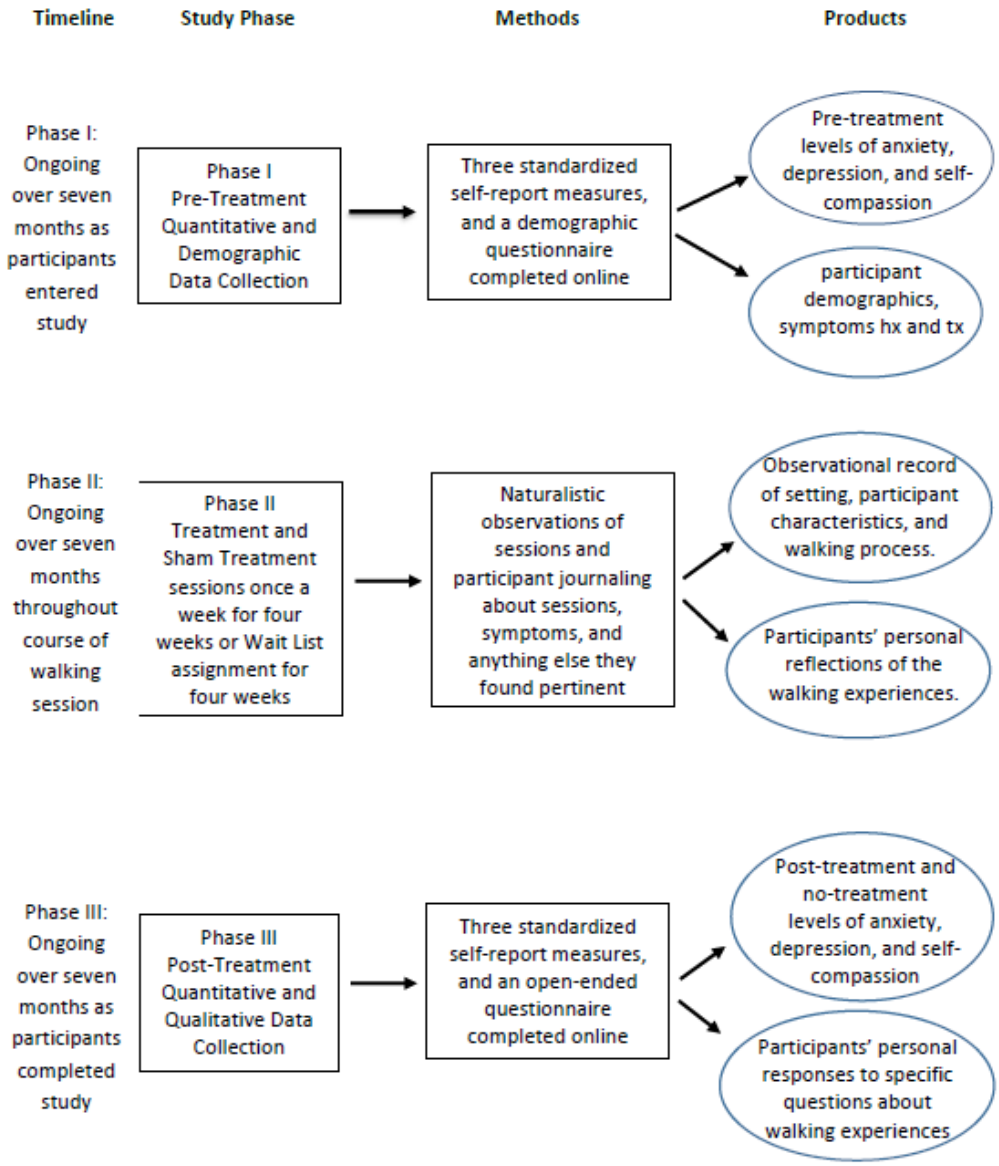
Figure 1. Sample of labyrinth patterns (Blonski, 2008).



Appendix B

Figure 2.

Diagram of the Procedures.



Appendix C

Dissertation Flyer

Research Study on the Effects of Mild to Moderate Walking Exercise

Are you 18 years of age or older?

Do you attend courses at OSU?

Have you been diagnosed with a depression and/or anxiety disorder?

Are you currently engaged in individual therapy?

Then you may be eligible to participate in this study!

Study to take place during the Fall 2016 semester.

Participants will be asked to…

complete two, short online surveys

participate in 4, 20 minute walking sessions

Participants may earn up to $20 as compensation for their time.

Contact us for more information!

sara.hills@okstate.edu

No prior exercise experience required.

Mild to Moderate Exercise study 701-214-0238 sara.hills@okstate.eu

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Mild to Moderate Exercise study 701-214-0238 sara.hills@okstate.eu

Appendix D

Table 1.

Demographics of participants by group.

	TG (n = 7)	ACG (n = 6)	WCG (n = 3)
Age (years)	18-23 (M = 21)	18-29 (M = 21)	18-30 (M = 22)
Weight (pounds)	132-220 (M = 158)	114-180 (M = 137)	104-335 (M = 196)
Height (inches)	63-66 (M = 64)	62-69 (M = 65)	53-59 (M = 56)
Student workers	n =5	n =1	n =2
Sexuality	Heterosexual (n =7)	Heterosexual (n =6)	Heterosexual (n =2) Bisexual (n =1)
Race	Caucasian (n =7)	Caucasian (n =4) Afr. Amer. (n = 2)	Caucasian (n =1) Afr. Amer. (n = 1) Asian (n = 1)
Current exercise	None (n =4) Occasionally (n =1) 3-4 times/week (n =2)	None (n =3) Walk to class (n =1) 1-2 times/wk (n =1) 5-6 times/wk (n =1)	None (n =1) Walk to class (n =1) 5-6 times/wk (n =1)
Tx by chiropractor	(n =1)	(n =0)	(n =0)
Tx by psychiatrist	(n =1)	(n =1)	(n =0)
Tx by counselor/therapist	(n =1)	(n =1)	(n =0)
Reported other diagnoses	Neurodevelopmental disorders (n =2)	(n =0)	(n =0)
Psychotropic medications	Rx SSRI (n =1)*	Rx SSRI (n =2)	Rx SSRI (n =1)

Note. Rx = prescription; Tx = treatment. Wk = week. TG = Treatment Group; ACG = Active Control Group; WCG = Wait-List Control Group. *One participant in the TG reported beginning and ended an antidepressant during the first two sessions (see Discussion section for details).

Appendix E1

INFORMED CONSENT

Project Title: **The Effects of Mild and Moderate Exercise On Symptoms of Depression and/or Anxiety**

Investigators: Principal Investigator: Sara J. Hills, M.S.; Advisor: John Romans, PhD

Purpose: The purpose of this mixed-methods study is to examine the effects mild and moderate exercise for college students diagnosed with anxiety and/or depressive disorders.
Procedures: If you choose to participate in this research, you will be asked to participate in a 20 minutes mild or moderate exercise walking session once a week for four weeks. You will also complete several short on-line questionnaires (approximately 15-20 minutes in length) at the beginning and end of the four weeks and keep a diary of your experiences for the duration of the study. The first questionnaire will begin after you give your consent to participate.

Risks of Participation: Because exercise is involved, you will be asked to complete a short questionnaire designed to gauge your readiness to begin physical activity. However, the type and intensity of exercise used in this study is not believed to be any more risky than walking from one place to another during a typical day. It is possible that those who have a history of panic or anxiety attacks may experience triggers for an attack during the course of an exercise session(e.g. quickened heart rate, rapid breathing, or sweating). It is not an objective of this study to induce a panic or anxiety attack. Any trigger of attack due to the mild to moderate walking exercise used in this study will be very rare and is not expected. Due to the uniqueness of individual responses, the possibility exists that published data (e.g. quotations, experiences) could be identifiable by others. All efforts will be made to de-identify participants to every extent possible.

Benefits: There is no guarantee of benefit directly to you as a result of this research. However, it is possible that your participation will contribute to a greater understanding of mild to moderate exercise as a complementary treatment of depression and/or anxiety.

Confidentiality: On-line data collected will be password protected by the survey website and password protected by computer log-in. Hard copy data will be stored in a locked filing cabinet in a locked room. Each participant will be assigned a numerical code that will be used to label all data. If the results of this study are published or presented at a conference, pseudonyms will be used to protect your confidentiality and any identifying information will be removed. All data and numerical codes, including master copy of codes with names, will be destroyed five years after the publishing of this dissertation.

Compensation: Two forms of compensation will be offered. Participants will choose one of them at the beginning of participation. Participants may choose either $5.00 compensation for participation in each weekly exercise session, for a total of $20.00 earned as compensation for your time. OR participants may choose to receive research participation credits through the College of Education SONA system. One research credit will be available for every hour of participation time for a total of 2 research hours. If you need to terminate an exercise session early due to unforeseen circumstances, you will still receive compensation for that session; however, there will be no compensation for sessions canceled prior to session start or for no-shows.

Contacts: If you have questions about this research, please contact Sara J. Hills, M.S., at sara.hills@okstate.edu.

If you have questions about your rights as a research volunteer, you may contact Dr. Hugh Crethar, IRB Chair, 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

Participant Rights: Participation in this research study is voluntary. You may choose to discontinue the research at any time without reprisal or penalty.

I have read and fully understand the consent form. By clicking the continue button, I understand that I am giving my consent to participate in this research and am further stating that my consent is given freely and voluntarily. A copy of this form is available for me to print should I desire to do so.

Continue.

Appendix E2

Release of Liability

I understand that there are always risks when engaging in any physical activity. I also understand that it is my responsibility to inform the researcher any physical limitations and that it is my responsibility to take care of my body during exercise sessions.

I understand that it is my responsibility to consult with a physician prior to and regarding my participation in this research should I desire to do so. I represent and warrant that I am able to participate in mild to moderate walking exercise and have no medical conditions that would prevent me from participation in the exercise sessions. I assume full responsibility for any injuries or damages, known or unknown, which I might incur as a result of participating in this study. I knowingly, voluntarily, and expressly, waive any claim I may have against Sara J. Hills, researcher, for injury or damages that I may sustain as a result of participating in the exercise sessions.

By clicking the continue button, I state my understanding of and agreement to the above statements.

Continue.

Appendix F

Demographic Information Sheet

Today's date:

Name _____Age_____ Ht. _____ Wt._____

Do you prefer text or email reminders of exercise sessions?

_____

If text, phone number _____

If email, address_____

Current Occupation_____

Race/Ethnicity _____ Gender _____ Sexual Orientation _____

1. Current exercise program:

_____

_____

2. Please fill in the following section for any condition for which you have been treated in the past two years.

Physician: -

_____

_____

Psychotherapist:

_____

_____

Chiropractor:_____

_____

Psychiatrist:_____

_____

Homeopathic or Naturopathic
Physician:_____

_____

Other (please list):_____

_____

8. Please list below any prescription or non-prescription medication you're taking:

_____

_____

9. Please describe any mental health treatment you are currently receiving (i.e. type, how often, how long, etc.

_____

_____

10. Please list any history of surgeries, major illness, chronic conditions, accidents, injuries, or anything that might be relevant which were not listed previously:

_____

_____

11. Please describe your current anxiety symptoms, if any.

_____

_____

12. Please describe your current depression symptoms, if any.

_____

_____

13. Please describe what you have previously tried to decrease your anxiety symptoms.

_____

_____

14. Please describe what you have previously tried to decrease your depression symptoms.

_____

_____

15. Please describe what you are currently doing that is working to alleviate your anxiety symptoms.

_____

_____

16. Please describe what you are currently doing that is working to alleviate your depression symptoms.

_____

_____

Continue

* Clicking continue will take the participant to the next questionnaires in random order, see Appendix F, G, and H.

Appendix G1

Physical Activity Readiness Questionnaire (PAR-Q)

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO		
☐	☐	1.	**Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?**
☐	☐	2.	**Do you feel pain in your chest when you do physical activity?**
☐	☐	3.	**In the past month, have you had chest pain when you were not doing physical activity?**
☐	☐	4.	**Do you lose your balance because of dizziness or do you ever lose consciousness?**
☐	☐	5.	**Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?**
☐	☐	6.	**Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?**
☐	☐	7.	**Do you know of any other reason why you should not do physical activity?**

Note. Answers of all "yes" on this questionnaire will automatically lead the participant to the Release of Liability form as seen in Appendix E2. Any answer of "no" on this questionnaire will automatically lead the participant to the next page where they will read the message provided below.

Thank you for your desire to participate in this study. At this time, it is determined that there may be a risk associated with your readiness for participation in a new exercise program. This risk makes you ineligible for participation. Thank you so much for your time to this point. We wish you well. If you have any questions, please feel free to contact Sara J. Hills, M.S., at sara.hills@okstate.edu.

Appendix G2

Patient Health Questionnaire – 9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
☐	☐	☐	☐

Continue

Appendix G3

Generalized Anxiety Disorder – 7 (GAD-7)

Over the last 2 weeks, how often have you been bothered by the following problems? *(Use "✔" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Continue

Appendix G4

Self-Compassion Scale (SCS)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____1. When I fail at something important to me I become consumed by feelings of inadequacy.

_____2. I try to be understanding and patient towards those aspects of my personality I don't like.

_____3. When something painful happens I try to take a balanced view of the situation.

_____4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____5. I try to see my failings as part of the human condition.

_____6. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____7. When something upsets me I try to keep my emotions in balance.

_____8. When I fail at something that's important to me, I tend to feel alone in my failure

_____9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____11. I'm disapproving and judgmental about my own flaws and inadequacies.

_____12. I'm intolerant and impatient towards those aspects of my personality I don't like.

Appendix H1

Figure 3.

The Morrill Hall Labyrinth.

Note. Arrows have been placed on the labyrinth to indicate the how the walk begins. The TG participants proceeded from bench to bench until they returned to the start which is marked with a star. The TG participants continued to walk the circuit repeatedly for 20 minutes.

Appendix H2

Figure 4.

The Library Lawn.

Note. A white rectangle has been placed on the photo to delineate the walking path for the ACG. The solid white start indicates the starting point and arrows have been added to delineate the direction of the walk. Outline stars are placed on the photo to mark the grassy area that the ACG participants walked around repeatedly for 20 minutes.

Appendix I

Scripts

Appendix I1, Screening Script.

Hello. Thank you for your interest in participating in my study. Before we begin the study, I have a few questions to ask you just to make sure you are an eligible participant. Are you at least 18 years of age? Do you have a diagnosis of a depression and/or anxiety disorder? Are you currently engaged in individual therapy?

* If participant answers "no" to any question: _____ is required to be eligible for this study. You are not eligible at this time. Thank you so much for your time and interest.

* If participant answers "yes" to all questions: Thank you. You seem to be eligible for participation in this study. I have a link to the consent form, study information, and initial questionnaires. I will need your email address to send you the link. Thank you. I will also need your phone number to call you back to schedule your first exercise session. Thank you. After you see the study information and consent form if you decide not to participate, I will destroy the information you have given me today. What questions do you have at this point? Thank you again for your interest and your time. I look forward to meeting you.

Appendix I2, Session Scheduling Script

Thank you for your consent to participate. We will begin the study sessions on _____. It is hoped that your sessions will be approximately one week apart. What

day and time works best for you to meet for an exercise session? Please meet me for your session at the bottom of the Morrill Hall stairs/by the Chi-O clock. I will have a sign with the word "research" on it. My phone number is 701-214-0238. Please call me if you need to reschedule. I will call you if I have a conflict as well. I look forward to meeting you. Remember, your day and time for your session are _____.

Appendix I3, Pre-Session Script.

Hello. I'm so glad you're here. Today, we will complete the first exercise session. You will walk through this labyrinth, turning at each bench to continue to follow the path to the center and out. There is no need to hurry. Please notice your breath as you walk. What questions do you have? You may begin when you are ready.

Hello. I'm so glad you're here. Today, we will complete the first exercise session. You will walk around the outside sidewalk of the formal garden from _____ to _____ and back (I will gesture to the course). You will walk around the course _____ times. As you walk, please notice your breath. Your breath should be fast enough that you cannot sing, but slow enough that you can still carry on a conversation while you walk. What questions do you have? You may begin when you are ready.

Appendix I4, Post-Session Script.

Thank you. You did great! Here is your compensation. Does the same time and day work for you next week? Please remember to keep a diary of your experiences in the labyrinth/walking the garden and of your time between sessions. See you next week! (For third session, the above script will be used, plus…) Remember to bring your diary next week.

Appendix I5, End of Sessions Script.

This was our last exercise session. Thank you so much for participating. Here is your compensation. We won't be meeting again, but these spaces are open to the public and free to use. You may continue your sessions if you'd like. There is a final online questionnaire to complete as the last step in the study. I will email you the link. Please complete the questionnaires soon. Any questionnaires not completed one week from now won't be included in the study. What questions do you have today? Thank you again for your time and participation. I wish you well.

Appendix I6, End of Study Script.

Thank you so much for participating. There is a final online questionnaire to complete as the last step in the study. Please complete the questionnaires soon. Any questionnaires not completed one week from today will not be included in the study. We won't be meeting again, but these spaces are open to the public and free to use. You may continue your sessions if you'd like.

Appendix J

Post-Treatment Open-Ended Interview Questions

1. Please describe your experiences walking in the labyrinth/formal garden.

2. How did it feel to walk in the labyrinth/formal garden?

3. What did you experience during your walk?

4. What were your expectations, if any, for your labyrinth/formal garden walk?

5. Were your expectations met?

6. Were you satisfied with your labyrinth/formal garden walking experience?

7. What did you like the most about your experience?

8. What did you like the least about your experience?

9. In what ways, if any, has walking in the labyrinth/formal garden impacted your life?

10. In what ways, if any, has walking in the labyrinth/formal garden impacted your health?

11. In what ways, if any, has walking in the labyrinth/formal garden impacted your anxiety and/or depressive symptoms?

12. Is there anything else that you think the researcher should know about your experiences during this study?

Thank you so much for your participation! Your time and effort is so appreciated. Please contact Sara J. Hills at sara.hills@okstate.edu if you have questions about this study. I wish you well.

Appendix K

Oklahoma State University Institutional Review Board

Date:	Tuesday, October 11, 2016
IRB Application No	ED16147
Proposal Title:	The Labyrinth: A Self-Compassionate Journey Out of Depression and/or Anxiety
Reviewed and Processed as:	Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 10/10/2017

Principal Investigator(s):

Sara Hills
Stillwater, OK 74078

John Romans
434 Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

Oklahoma State University Institutional Review Board

Date:	Wednesday, February 01, 2017	**Protocol Expires: 10/10/2017**
IRB Application No:	ED16147	
Proposal Title:	The Labyrinth: A Self-Compassionate Journey Out of Depression and/or Anxiety	
Reviewed and Processed as:	Expedited **Modification**	

Status Recommended by Reviewer(s) **Approved**

Principal Investigator(s):

Sara Hills
Stillwater, OK 74078

John Romans
434 Willard
Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

☐ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

Mod to continue collecting data beyond Fall 2016 semester. Recruit via community bulletin boards, and SONA (SONA participants can choose either SONA credit or monetary payment).

Signature :

Hugh Crethar, Chair, Institutional Review Board

Wednesday, February 01, 2017
Date

Number of copies to be submitted:
One (1), single sided paper copy of the modification form and associated attachments, signed by the primary PI and advisor (if appropriate). Scanned/faxed signatures are acceptable.

Submission Address:
IRB/University Research Compliance
Oklahoma State University
223 Scott Hall
Stillwater, OK 74078-2016

For assistance, please contact the IRB staff in the Office of University Research Compliance at 405-744-3377 or email irb@okstate.edu.

COE SONA participation compensation statement to be added to the existing approved monetary compensation in the original IRB.

Participants will earn course credit for their participation. Many introductory and lower-level College of Education and other courses offer students a small amount of course credit (usually less than 5% of their grade) for participation in the research process. Whether for required credit or extra credit, each course must offer alternatives to research participation for earning credit. For example, in Educational Psychology courses students have the opportunity to earn five "units" of research experience.

This requirement may be fulfilled in one of four ways:
1) serving as a human participant in current research project(s),
2) attending special research events,
3) researching and writing 4 page papers on designated research topics, or
4) co-creating relevant educational experience with their instructor.

Each hour of participation in a research project as a participant is generally regarded as satisfying one "unit" of the requirement, students completing a half hour will receive 0.5 unit.
Students participating in this study will earn 2 units of credits as this study will take approximately 120 minutes to complete.

Appendix L

Figure 5.

Expected Ordinal Patterns.

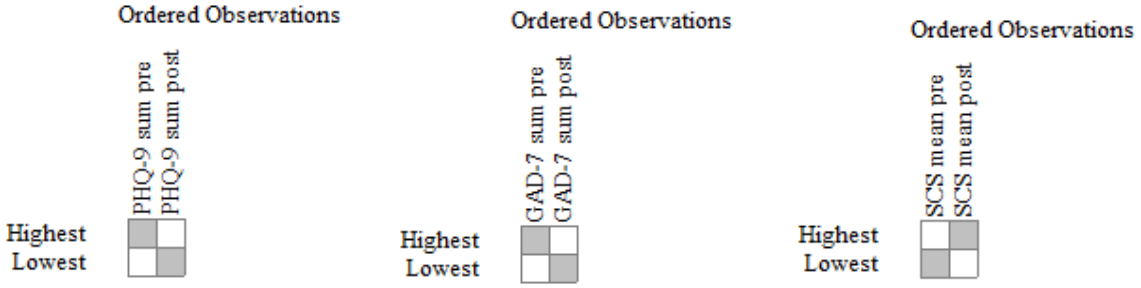

Figure 5. The shaded boxes indicate the expected ordinal patterns of change from pre- to post-treatment (PHQ-9 and GAD-7: pre-scores > post-scores; SCS-SF: pre-scores < post-scores).

Figure 6.

Expected Ordinal Magnitude of Change.

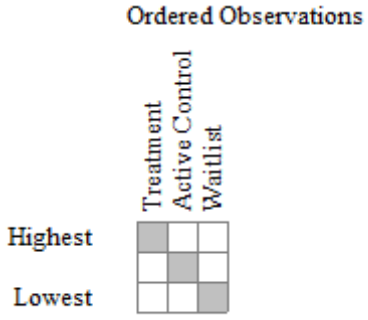

Figure 6. The shaded boxes indicate the expected magnitude of the change scores on each measure by group (TG > ACG > WCG).

Appendix M

Table 2.

Results for PHQ-9, GAD-7, and SCS-SF, including pre- and post-score range and mean as well as number of correct cases (# CC), percent of correct classifications (PCC), and the *c*-values.

		PHQ-9			
Group	Pre-Score	Post-Score	# CC	PCC	*c*-value
TG	2-18 (*M* =10.43)	3-21 (*M* = 10.14)	2 of 7	28.57	0.89
ACG	4-15 (*M* = 9.83)	2-12 (*M* = 6.50)	4 of 6	66.67	0.33
WCG	10-18 (*M* = 15.67)	9-14 (*M* = 14.00)	2 of 3	66.67	0.23
		GAD-7			
TG	4-20 (*M* =11.71)	5-15 (*M* = 9.00)	2 of 7	28.57	0.67
ACG	5-18 (*M* = 12.17)	2-17 (*M* = 7.33)	6 of 6	100.00	0.02
WCG	8-19 (*M* = 12.33)	4-16 (*M* = 10.33)	2 of 3	66.67	0.50
		SCS-SF			
TG	1.37-3.08 (*M* =2.45)	1.58-3.00 (*M* = 2.33)	1 of 7	14.29	0.98
ACG	2.42-3.50 (*M* = 3.07)	2.58-3.67 (*M* = 3.25)	5 of 6	83.33	0.10
WCG	2.25-3.00 (*M* = 2.56)	2.17-2.92 (*M* = 2.56)	1 of 3	33.33	0.87

Note. TG = Treatment Group; ACG = Active Control Group; WCG = Wait-list Control Group.

Table 3.

Results for PHQ-9, GAD-7, and SCS-SF change scores from pre- to post-treatment as well as number of correct cases (# CC), percent of correct classifications (PCC), and the *c*-values.

PHQ-9			
Group	# CC	PCC	*c*-value
TG > ACG	10 of 42	23.81	0.93
TG > WCG	4 of 21	19.05	0.94
ACG > WCG	11 of 18	61.11	0.34
GAD-7			
TG > ACG	9 of 42	21.43	0.94
TG > WCG	10 of 21	47.62	0.56
ACG > WCG	12 of 18	66.67	0.28
SCS-SF			
TG > ACG	32 of 42	76.19	0.06
TG > WCG	16 of 21	76.19	0.13
ACG > WCG	4 of 18	22.22	0.91

Note. TG = Treatment Group; ACG = Active Control Group; WCG = Wait-list Control Group.

Appendix N

Figure 7.

Brittany's walking pattern.

Note. Arrows have been placed on the labyrinth to indicate Brittany's approximate path. Brittany proceeded along the shortest path possible through the labyrinth and therefore, walked a greater number of circuits than her TG counterparts.

Appendix O

Figure 8.

Convergent independent mixed-methods design (Creswell & Plano Clark, 2011).

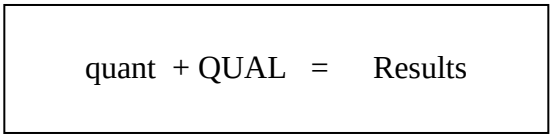

Figure 8. Quantitative and qualitative data are collected independently yet simultaneously and analysis is combined during discussion with more emphasis on the qualitative data (Creswell & Plano Clark, 2011).

Appendix P

Table 4.

Severity of depressive and anxiety symptoms and level of self-compassion pre- and post-treatment as determine by measure cut-scores.

	PHQ-9							
	(n =)				(n =)			
	Pre-				Post-			
Group	N	MI	MO	S	N	MI	MO	S
TG	2	1	2	2	2	2	1	2
ACG	1	3	0	1	4	1	1	0
WCG	0	0	2	1	0	1	2	0
	GAD-7							
	Pre-				Post-			
Group	N	MI	MO	S	N	MI	MO	S
TG	2	1	1	3	0	4	1	2
ACG	0	2	2	2	2	3	0	1
WCG	0	1	1	1	1	0	1	1
	SCS-SF							
	Pre-				Post-			
Group	L	M	H		L	M	H	
TG	4	3	0		3	4	0	
ACG	1	3	2		0	4	2	
WCG	2	1	0		1	2	0	

Note. Number in each column is *n* = for each group. TG = Treatment Group; ACG = Active Control Group; WCG = Wait-List Control; N = None, MI = Mild; MO = Moderate; S = Severe; L = Low; M = Moderate; H = High.

Appendix Q

Figure 9.

Speculative mechanisms behind MM.

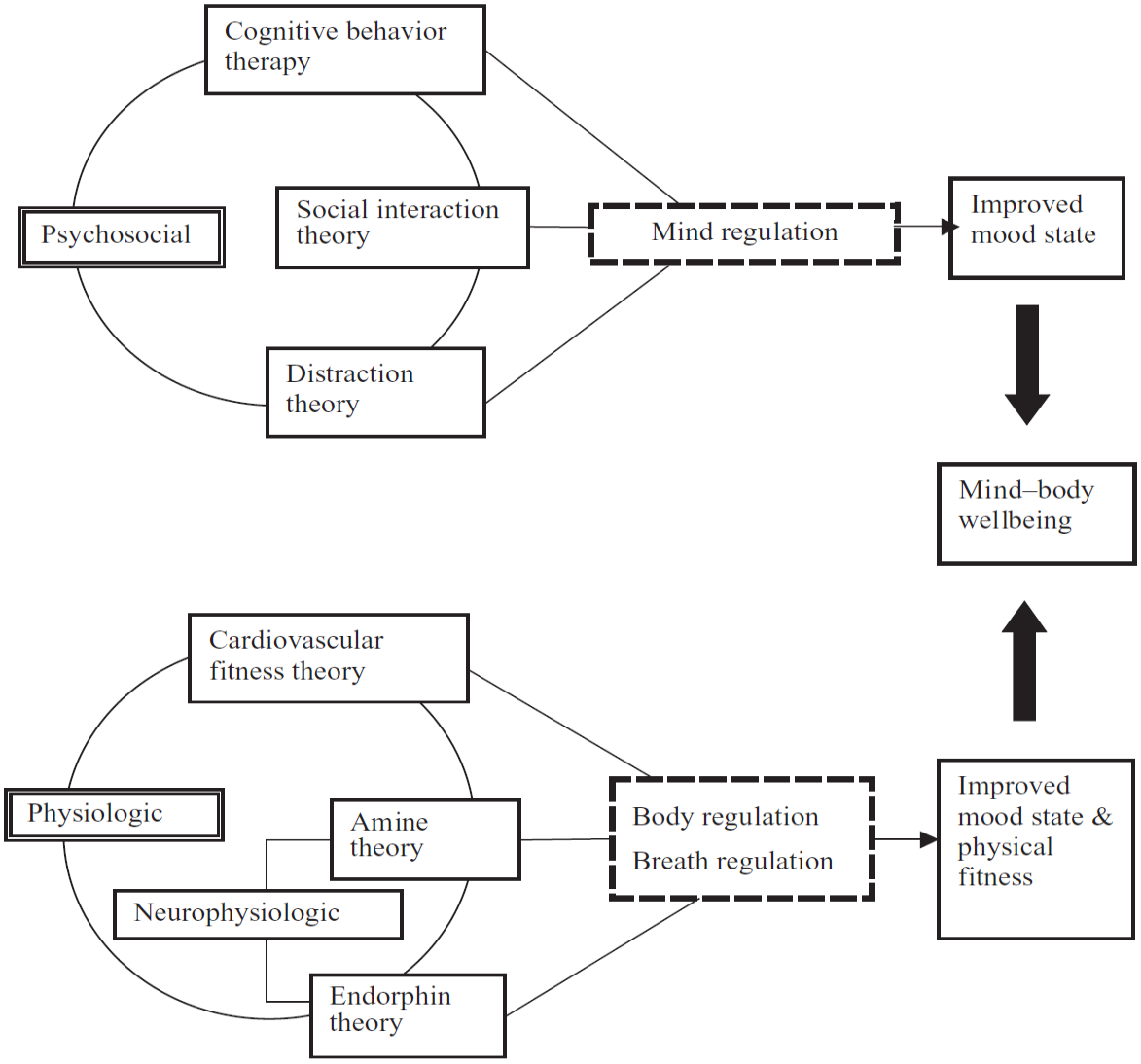

Figure 9. Possible effects of *qigong* on mind-body well-being – a biopsychosocial model (p. 834, Chow & Tsang, 2007).

Appendix R

Extended Literature Review

Anxiety and Depression

The prevalence and impact of mental and behavioral disorders is high worldwide (WHO, 2001). The World Health Organization (2001) reported that one in four families across the globe is experiencing the burden of a family member with a mental or behavioral disorder. Mental and behavioral disorders accounted for 10.5% of documented disabilities in 1990. In the year 2000, this number rose to 12.3%. Analysists predict prevalence will continue to climb and estimate that by the year 2020, 15% of all documented disabilities will be the related to mental and behavioral disorders (WHO, 2001).

Of these disorders, depression accounts for the largest number of mental health disorders affecting individuals worldwide (DeVol & Bedroussian, 2007; WHO, 2001). Depression affects approximately 5-13% of women and 2-8% of men at some point during their lifetime. The lifetime prevalence rate of depression is for all genders 16.2% and in a twelve-month period is 6.6% (Kessler et al., 2003; Pincus & Petit, 2001). Symptoms of depression include sadness, fatigue, feeling empty, low self-esteem, and lost interest in engaging in activities. These symptoms are also paired with other cognitive and somatic changes, such as difficulty concentrating and disturbed appetite, which drastically impair daily functioning. Depressive symptoms can range from mild to severe; be episodic, chronic, or recurrent; and may be present for as little as two weeks or

as long as a lifetime. Often symptoms of depression are accompanied by passive and/or active suicidal thoughts and individuals may choose to end their lives to escape their symptoms (DeVol & Bedroussian, 2007; DSM-5, 2013; WHO, 2001). Depression is the fourth leading "cause of burden" at present. If current trends continue, by the year 2020, depression will be the second leading cause of burden among all diseases (WHO, 2001).

The cost and suffering associated with mental and behavioral disorders is not limited to severe disorders such as major depressive disorders only. Anxiety and panic disorders also have a large effect on individuals, families, and communities (WHO, 2001). Anxiety disorders are either present before or with major depression. Both anxiety and depression are thought to be genetically based and related to the same genes. Development of one, the other, or both appears to be determined by environmental factors (Kendler, Neale, Kessler, Heath, & Eaves, 1992). Anxiety and depression are the two most common mental health disorders and their comorbidity seriously impacts identification and treatment (WHO, 2001; Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007).

Despite indications that depression is the most prevalent mental health issue worldwide, it is thought that the single most frequently occurring psychiatric illnesses in the United States are anxiety disorders. Anxiety remains largely ignored in comparison to depression and is often untreated and undiagnosed due to the fact that as many as 30% of those experiencing symptoms do not seek treatment (Kroenke et al., 2007; Shirneshan, 2013). Anxiety disorders are usually chronic, can be incapacitating, and cause a great individual and social burden. The economic costs of anxiety disorders include inpatient, outpatient, and emergency care; hospitalization; pharmaceutical treatment; reduced

productivity; absenteeism from work; and suicide (Lépine, 2002). Further, there is less attention to research, public awareness, detection, and treatment of anxiety in the general population putting many individuals at risk (Kroenke et al., 2007).

In addition to the risks associated with the comorbidity of depression and anxiety disorders, depression is often co-morbid with increased makers of pro-inflammation (i.e. C-reactive protein and interleukin-9) and has been shown to be a risk factor for development and progression chronic illnesses such as coronary heart disease. (Prakhinkit, Suppapitiporn, Tanaka, & Suksom, 2014). The comorbidity of medical and emotional concerns are often cyclical and overlapping – each contributing to the other. In other words, medical conditions, chronic conditions in particular, frequently lead to depression and depression continues to worsen and prolong physical illness in a seemingly never-ending cycle (Indian Journal of Medical Sciences, 2001).

Health care for mental disorders is very expensive and costly from both an economic and personal standpoint. Families and individuals impacted by mental disorders experience the loss of employment potential, leisure time, and social relationships. These losses are due to the direct impact of the symptoms of the disorders themselves and the impact of caring for relatives and friends that are experiencing mental disorders. Communities are directly impacted by mental disorders as well and often suffer from individual loss of productivity, legal consequences and costs, losses associated with premature mortality, and the cost of providing health care and support (WHO, 2001). Improved recognition and treatment of depression and anxiety disorders is necessary to reduce the burden these disorders place on individuals, the health care system, and society as a whole (Lecrubier, 2001).

Treatment of Anxiety and Depression

Treatment of anxiety and depression has been dominated by psychotherapy and pharmacological interventions. Psychotherapeutic treatment is largely done using Cognitive Behavioral Therapy and behavioral interventions. Many individuals who suffer from depression and anxiety, however, do not seek traditional treatments in the form of therapy and medications. This is sometimes due to the stigma associated with mental health treatments or beliefs about the efficacy of psychological treatments (Payne & Crane-Godreau, 2013; Gilpin, 2008; Salmon, 2001). In addition, some individuals do not respond to or engage in traditional psychotherapy and pharmacological interventions. Many of these individuals are now looking for their own alternative and complementary therapies such as exercise (Craft, 2005; Salmon, 2001).

Exercise as an Alternative and Complementary Treatment

Behavioral intervention is a well-supported and common intervention used in the treatment of mood disorders (Streeter, Whitfield, Owen, Rein, Karri, Yakhkind, Perlmutter, Prescot, Renshaw, Curaulo, & Jensen, 2010). Regular exercise has been associated with decreased risk for developing several chronic illnesses such as diabetes, stroke, and coronary heart disease (Chow & Tsang, 2007; Prakhinkit et al., 2014). In addition, exercise buffers against the harmful effects of stress, is an anxiolytic, and an antidepressant. This is particularly true when anxiety and depression symptoms fall in the mild to moderate range (Chow & Tsang, 2007; Craft, 2005; Prakhinkit et al., 2014; Salmon, 2001). Effects of exercise on anxiety and depression symptoms compare positively with effects of pharmaceutical intervention and psychotherapy and exercise may also be a more acceptable treatment for individuals who do not wish to engage in

traditional psychotherapy and pharmacological treatment (Salmon, 2001; Streeter et al., 2010). Finally, exercise is easily accessible to the general population, while psychotherapy and pharmacological treatments are not (Salmon, 2001).

Researchers have explored the effects of exercise on physical health much longer than they have focused on the effects of exercise on psychological health. The length of time considered adequate for exercise intervention is often considered 10-12 weeks. This duration is based on researchers' understanding of cardiovascular health and conditioning. In response to the determination that 10-12 weeks is adequate for developing cardiovascular conditioning, researchers interested in the psychological effects of exercise have adopted a similar required duration expectation. However, the 10-12 week duration may not be necessary to see significant psychological effects from exercise, as psychological wellness does not seem to be connected to cardiovascular or aerobic fitness. Yet, it now appears that physical fitness does not uniformly result in improved mood and overall psychological wellness (Salmon, 2001). Individuals with chronic illnesses such as cancer, fibromyalgia, and chronic fatigue may not be receptive to vigorous exercise intensity and likely benefit from the acute effects of even one mild to moderate exercise session. "…[E]motional benefits arise from the accumulation of acute mood improvement caused by the individual sessions of exercise." (p. 42, Salmon, 2001) - before there has been an opportunity for improved cardiovascular fitness. Researchers do also acknowledge that greater impact was experienced when exercise was adopted as a lifestyle change and individuals engaged in habitual exercise over their lifetime (Salmon, 2001; Streeter et al., 2010). It seems that lifelong effective psychological exercise intervention will, therefore, not likely be entirely dependent on cardiovascular and

aerobic fitness. Psychological wellness may be associated with participation in mild to moderate movement activities adopted as a lifestyle change (Salmon, 2001).

Exercise is most often considered a positive endeavor when it is of mild to moderate intensity and most individuals will stay with mild to moderate exercise programs as a lifestyle change more readily than they will vigorous exercise regimens. In addition, individuals who are asked to exercise beyond their physical capacity view exercise more negatively and may experience increased anxiety symptoms and fatigue (Salmon, 2001; Steptoe & Cox, 1988; Ströhle, 2009). In order for individuals with depression and anxiety to engage in and maintain habitual exercise, initial exercise experiences must avoid over demand (Streeter et al., 2010; Ströhle, 2009). Yet, it is often difficult to truly determine how effective exercise is for individuals who do not like to exercise as these individuals are less likely to volunteer for a study that involves exercise (Salmon, 2001).

It is also difficult to determine if the successful integration of exercise into the lifestyle is implementation of successful intervention or evidence that previous treatment is working. It is quite possible that participants volunteer for research on the effects of exercise and continue exercising as a result of reductions in symptoms that took place before engaging in exercise (i.e. previous psychotherapy gains) (Craft, 2005; Salmon, 2001). In this case, exercise may increase coping self-efficacy as well as self-efficacy for the exercise task itself – individuals may be reinforced by the knowledge that they can choose and maintain engagement in an activity that helps them feel better (Craft, 2005).

Mind-Body Exercise and Meditative Movement as an Alternative and Complementary Treatment

Mind-body therapies are some of the oldest and most effective forms of medicine. Mind-body techniques have been used to successfully treat chronic conditions such as carpal tunnel syndrome, migraine, fecal incontinence, cancer, pain, skin conditions, fibromyalgia, and tension headaches. Most modern mind-body interventions and treatments are used in conjunction with traditional medical treatments. Therefore, it is difficult to differentiate the benefits of traditional medicine and mind-body treatments. One trend is clear; however, mind-body medicines enhance traditional medicine and are successful in helping to treat a variety of physical and emotional issues and symptoms. Overall, results from the study of the effectiveness of mind-body interventions suggest that mind-body interventions are a positive integrative intervention and treatment that complements traditional therapies and medicine (Indian Journal of Medical Sciences, 2001).

Mind-body practices such as yoga, meditation, Tai Chi, and guided imagery, are defined by the National Center for Complementary and Integrative Health (2016) as practices that "promote health by facilitating interactions among the brain, mind, body, and behavior." MM interventions involve focused awareness on the body, some kind of instructed movement, observation of the breath, and deep relaxation. MM interventions have been shown to improve balance, clam the mind, induce relaxation, lower blood pressure, improve function of the immune system, reduce inflammation, increase overall general wellness, decrease anxiety and depression, and stimulate positive affect (Oh et al., 2013; Payne & Crane-Godreau, 2013).

Researchers have found evidence that MM is as effective as traditional exercise for reducing heart rate and blood pressure, improving balance, increasing bone density,

increasing strength, and increasing aerobic capacity despite the fact that MM is gentle and involves mild to moderate exertion. While there is no one definition of MM interventions, research indicates that it is clear that these movement activities are very different from traditional or athletic exercise. MM participants in studies with control participants in traditional or athletic exercise groups experienced similar or better outcomes for improved physical health and overall better outcomes for emotional health (Oh et al., 2013; Payne & Crane-Godreau, 2013). A study for the use of Qigong with patients experiencing fibromyalgia symptoms found improvement in pain, mood, fatigue, and sleep disturbance with intervention once a week for eight weeks. In addition, analysis of mind-body therapy studies of use with cancer patients reported experiencing less pain, reduced stress, and an overall improved quality of life (Indian Journal of Medical Sciences, 2001). Finally, participants in the yoga group reported improvement in mood and reduction in anxiety greater than those reported by the metabolically matched walking group. The yoga group also showed decreases in reported levels of fatigue (Streeter et al., 2010). Similar to the earlier reported outcomes of exercise intervention, results of Streeter et al.'s (2010) research suggest that the benefits of yoga are not solely the product of increased exercise and activity (Salmon, 2001).

Further, some studies included in Payne and Crane-Godreau's review (2013) demonstrated some evidence that MM intervention groups out-performed seated meditation controls decreasing symptoms of anxiety. Payne and Crane-Godreau (2013) and others found no evidence or report of adverse effects in any of the reviewed studies. Even in studies where small or no differences were observed between groups, advantages such as the ease, safety, and cost-effectiveness of engaging in MM activities

warrant the consideration and use of MM interventions for psychological treatment. Perhaps even more encouraging, some researchers compared the effects of MM to traditional psychotherapies such as Cognitive Behavioral Therapy and determined that MM was equally successful (Payne & Crane-Godreau, 2013).

Individuals using mind-body therapies may experience relaxation-related benefits in as little as a few minutes and most will receive relief of symptoms in a single session; however, similar to traditional exercise, it make take several weeks or months of practice to experience optimal benefits (no author; Salmon, 2001; Streeter et al., 2010). Oh, Choi, Inamori, Rosenthal, & Yeung (2013), found that regular practice was pertinent to maintenance and long-term benefits. Several studies also found that many of the MM interventions required learning new skills (i.e. positions needed for yoga and Qigong, for example) and therefore, training combined with practice time was necessary to achieve optimum results (Chow & Tsang, 2007; Payne & Crane-Godreau, 2013). Qigong and other MM may be difficult to master as the movements are specific and must be taught to participants. Many researchers conclude that most studies do not continue long enough for participants to master the movements (Payne & Crane-Godreau, 2013). Similar to traditional exercise, self-efficacy and motivation may be enhanced when MM is incorporated into a lifestyle rather than used as a short-term intervention (Salmon, 2001; Steptoe & Cox, 1988; Ströhle, 2009; Sandor & Froman, 2006; Chow & Tsang, 2007; Gilpin, 2008; Payne & Crane-Godreau, 2013; Craft, 2005).

Mindfulness

Tai Chi, Qigong, and Yoga seem to be chosen for scientific study more than other forms of MM such as Buddhist walking meditations, Aikido, and Somatics (Payne & Crane-Godreau, 2013). The common factor between meditation, yoga, Tai Chi, and Qigong is believed to be mindfulness (Chow & Tsang, 2007; Kabat-Zin, 1994). Mindfulness, in turn, is believed to be the key to a way of being. Mindfulness is the opposite of taking life for granted (Kabat-Zin, 1994). "Mindfulness approaches are not considered relaxation or mood management techniques; however, but rather a form of mental training to reduce cognitive vulnerability to reactive modes of mind that might otherwise heighten stress and emotional distress or that may otherwise perpetuate psychopathology." (p. 231 emphasis in the original, Bishop et al., 2004). In their article, *Mindfulness: A proposed Operational Definition,* Bishop et al. (2004) further stated: "Although various meditation practices are taught in mindfulness approaches to treatment, they are similar in their basic procedures and goals." (p. 231).

Bishop et al. (2004) offer a two component model for mindfulness that incorporates (a) "…self-regulation of attention so that it is maintained on the immediate experience, thereby allowing for increased recognition of mental events in the present moment." or sustained attention and (b) "…adopting a particular orientation toward one's experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance." or switching – the flexibility to bring attention back to a breath once a thought, feeling, or sensation has been acknowledged (p. 232). They argued that mindfulness involves self-regulation for sustained attention, attention switching, and inhibition of elaborative processing, proposing that mindfulness is a

metacognitive skill. They further stated that mindfulness includes an attitude of curiosity where individuals are not trying to change how they are feeling or trying to induce relaxation, just noticing everything that arises. This curiosity is coupled with a stance of acceptance where individuals begin to abandon the need to change the current experience and instead allow an active process of allowing whatever happens or comes and being open to that experience (Bishop et al., 2004).

Bishop et al. (2004) further suggest that mindfulness is not a state that need only be applied during seated meditation, but one that can also enhance mind-body interventions and can be developed during the course of psychotherapy treatment. Many therapists are utilizing mindfulness in the psychotherapy practices, sometimes in the form of direct intervention as in Mindfulness-Based Cognitive Therapy and through the use of meditative movement before, during, and after therapy sessions (Gilpin, 2008; La Torre, 2004; West, 2000). The focus on mindfulness as a way of being and thoughts as events is very different than traditional therapeutic interventions designed to increase awareness of thoughts in order to evaluate and change the thoughts and hopefully influence behavior (Gilpin, 2008). Because mindfulness is not just a technique used in therapy or during the action of meditation or MM, it has the potential to maintain psychological health as well. In so doing, mindfulness has the capacity to reduce the risk of recycling back into old coping mechanisms and relapsing into previous states of distress and disorder (Bishop et al., 2004).

While this document does not have enough space to fully explore a Buddhist life-style, it is important to note that much of the Western focus on mindfulness, mindfulness meditation, and MM originates from Buddhist teachings. Mindfulness from a Buddhist

perspective is thought to lead "to tranquility …, a calm and contented state that is particularly useful in counteracting 'restlessness and worry…'" (p. 228, Gilpin, 2008). Mindfulness also brings about increased awareness and promotes a feeling of purpose. This awareness includes a present-focused attention that is alert and open to the connection of things and their relative value. Buddhism also cultivates values directed toward "moral self-protection and the protection of others." (p. 229, Gilpin, 2008). From this protective stance, mindfulness brings clarity of thought that allows for making ethical decisions (Gilpin, 2008).

"Mindfulness counteracts unconscious, habitual ways of thinking and responding." (p. 42, Gilpin, 2008). With practice, this way of being becomes natural and unplanned. Mindfulness is taken into the everyday experience rather than used as an antidote when attempting to avoid stress or discomfort. Events are experienced with acceptance rather than avoidance and observed with interest and openness rather than judgement (Gilpin, 2008). Many of the characteristics of mindfulness are taken from the Buddhist practice and have been utilized for the treatment of a variety of physical and mental health issues. In particular, mindfulness interventions have been found useful in the treatment of eating disorders, anxiety, panic attacks, depression, borderline personality disorders, and chronic pain (as cited Gilpin, 2008, p. 233).

A mindfulness state involves a present-focused awareness with attention directed at contextual events (i.e. environmental phenomenon, thoughts, feelings, breath, etc.). Noticing these events, but not judging them. The mindfulness quest is paradoxical in that it is goalless (Gilpin, 2008). It is not important whether or not you like or do not like your mindfulness practice, only that you set aside this judgement and open yourself to

what may come (Kabat-Zin, 2000). “Mindfulness is the powerful antidote to the powerful pull of all-or-nothing or black-and-white thinking.” (p. 40, Kumar, 2015). People who experience distress often believe their distress will never ease or that the only desired goal is happiness. “Mindfulness reminds us that life is lived in the shades of gray in between.” (p. 40, Kumar, 2015). Mindfulness allows for acceptance of whatever you are feeling in the moment. Mindful people become more patient with themselves because they understand that feelings come and go (Kumar, 2015).

Mechanisms: The process.

The mechanism behind the success of exercise’s effects on depression and anxiety are not well understood (Salmon, 2001; Ströhle, 2009). However, it is likely that underlying mechanisms are a combination of complex psychological and neurobiological processes. In the real world, it is not possible for one single theory to account for the complexities of the effects of exercise on mood. At present, researchers are far from being able to design a model that accurately explains the mechanisms underlying exercise as a treatment for depression and anxiety; however, in addition to the speculated mechanisms underlying exercise as a treatment for depression, it seems that exercise as a treatment for panic disorder includes an added process of exposure therapy as the increase heart rate, respiratory rate, and the other body contexts of exercise activities may simulate some of the experiences of individuals who suffer from panic disorder.(Craft, 2005;Ströhle, 2009).

Similarly, there are many theories that describe possible mechanisms for increased health and well-being resulting from MM interventions. Many of these theories are supported by evidence of physiological and anatomical changes that occur as

a result of MM interventions and indicate that the underlying mechanisms leading change in MM may be very different from the mechanisms at play with traditional exercise. Metabolic expenditure, the use of smooth rhythmic movements, attention to correct posture in each movement, balanced grounding of the body as a whole, interoception, and the use of imagery may impact MM outcomes. Like mindfulness, MM has been shown to increase cognitive control and attention. In addition, MM may help to draw attention away from ruminative thinking, promote a here-and-now perspective, and rewire the brain leading to long-term changes in thinking patterns and behavior (Payne & Crane-Godreau, 2013).

Rumination is a central component to increased negative affect. Depressed and anxious individuals often engage in ruminating thinking patterns (Bishop et al., 2004; Chow & Tsang, 2007; Craft, 2005). Rumination can contribute to both depression and anxiety. Anxious ruminative thoughts lead to excessive planning and development of possible strategies to avoid anticipated negative future events. Depressive ruminative thoughts lead to desires to change parts of the self that are assumed to be faults or to ways to regain some aspect of the self that was lost (Bishop et al., 2004). Disengaging from goal-seeking decreases both ruminative thinking and cognitive vulnerability to certain types of psychopathology such as depression and anxiety. (Bishop et al., 2004; Chow & Tsang, 2007). Depressed individuals who exercise or engage in MM habitually may find that the distraction from their ruminative thinking may decrease their feelings and symptoms of depression (Craft, 2005; Chow & Tsang, 2007; Payne & Crane-Godreau, 2013).

Chow and Tsang (2007) offer a biopsychosocial model that attempts to explain the underlying mechanism for the effects of Qigong. Figure 9 found in Appendix Q details this model. Chow and Tsang's speculative model (2007) may be appropriate for explaining the mechanism at work with MM in general as the common factor between MM forms are believed to be similar (Kabat-Zin, 1994; Bishop et al., 2004).

Chow and Tsang's speculative model (2007) integrates both a psychosocial mechanism and a physiological mechanism. Within the psychosocial mechanism portion of the model, there are three theories: Cognitive Behavioral Theory, Social Interaction Theory, and Distraction Theory. Cognitive Behavior Theory explains the relationship between exercise and improved well-being by stating that participation in exercise increases fitness which increases self-esteem, self-efficacy, and self-appraisal which in turn promote further commitment to continued exercise. This interplay of cognitive and behavioral factors is deemed a positive cognitive behavioral cycle that promotes physical and psychological well-being (Chow & Tsang, 2007).

The authors posit that the mindful state of Qigong and the positive words associated with mindfulness such as peaceful, relax, and calm, result in the relaxation response. Further, studies indicate that Qigong is effective in improving physical functioning and reducing fatigue, stress, anxiety, and negative emotions. The relaxation response, increased fitness, positivity, and mindful state become associated with the Qigong postures and movements resulting in a similar cognitive behavioral cycle as that described for traditional exercise (Chang & Tsang, 2007).

Chow and Tsang (2007) also provide evidence that Distraction Theory may be involved. They suggest that mindfulness practice and relaxation involved in movement

meditation exercises may provide a path to distraction from the ruminative thoughts associated with depression and anxiety. The present-focused, non-judgmental awareness used in mindfulness may keep negative thoughts at bay. This "cognitive 'time-out'" may be useful as a way to reduce daily stress and improve well-being (Chow & Tsang, 2007).

Finally, Chow and Tsang speculate that Social Interaction Theory also plays a role in the effects of Qigong on psychological well-being. They argue that the Qigong is done in a relaxed environment where there is no desire for competition with others may have beneficial effects to wellness. They also stated that Qigong is an activity that anyone can do regardless of gender, age, or physical ability. This inclusive, positive, friendly activity that can be done in a group may foster feelings of connection to a common humanity resulting in positive effects to psychological well-being (Chow & Tsang, 2007).

The physiological mechanisms integrated by Chow and Tsang (2007) include: Cardiovascular Fitness Theory, Amine Theory, and Endorphin Theory. The Cardiovascular Fitness Theory proposes that aerobic exercise enhances many components of physical and functional fitness. Researchers provided evidence supporting the idea that moderate exercise increases physical fitness and improves mood. Studies of mind-body therapies, including Qigong, have shown that it may not be necessary to use only moderate aerobic exercise to accomplish similar fitness goals and to surpass the effects of traditional exercise on mood (include other citations here). The movements and breathing techniques used in Qigong may assist in regulating the Autonomic Nervous System and improve cardiovascular fitness with mild, tranquil exercise. The ease and simplicity of movements involved in Qigong, yoga, walking, and other mind-body

interventions may encourage greater adherence and compliance to lifelong practice. Awareness of the body and movement during Qigong may improve self-regulation and restore health (Chow & Tsang, 2007).

The Amine Theory involves decreasing cortisol – a stress-related hormone - in order to improve psychological and physical health. Chow and Tsang (2007) suggest that Qigong lowers cortisol levels by "Enhancement of parasympathetic tone and a reduction of sympathetic activity" which leads to lower blood pressure, lowered levels of "noradrenaline, adrenaline, adrenocorticotropic hormone (ACTH), [and] cortisol," reduced anxiety and overall stress. The authors offer that the Amine Theory is plausible, but is again another area for continued research due to conflicting findings (Chow & Tsang, 2007).

Last, the Endorphin Theory is used to explain reduction of pain modulation (via morphine-like properties), pessimistic emotions, and anxiety via the action of endorphins. Chow and Tsang (2007) suggest that the "blissful-like experience" of Qigong in combination with its mindful, meditative states may decrease anxiety and regulate mood by stimulating the brain α-waves which is closely related to increased endorphin activity. In sum, Qigong may regulate immune and neuroendocrine systems affecting biological and neurological functioning (Chow & Tsang, 2007).

These six theories integrated together may help to explain the complex mechanism behind mind-body interventions and therapies such as Qigong. Even though this model presents a speculative understanding of the mechanisms behind the effects of meditative movement interventions such as Qigong, many other studies provide evidence in support of the mechanisms outlined by the model (Bishop et al., 2004; Gilpin, 2008;

Kinser & Robins, 2014; Payne & Crane-Godreau, 2013; Prakhinkit et al., 2014; Salmon, 2001; Shin, Kim, Jung-Choi, Son, Koo, Min, & Chae, 2013). However, further study is warranted to confirm the tenets of Chow and Tsang's model (Chow & Tsang, 2007).

Self-Compassion

Several studies of the effects of MM on anxiety and depression include measures of self-esteem and have demonstrated that MM increased self-esteem and perhaps played a role in the mechanisms behind MM interventions (Payne & Crane-Godreau, 2013; Shin et al., 2013; Chow & Tsang, 2007; WHO, 2001). Self-esteem is defined as an evaluation of self in areas deemed important to the self (Barnard & Curry, 2011; Leary, Tate, Adams, Allen, & Hancock, 2007; Neff, 2009; Neff & Vonk, 2009). While self-esteem is correlated to positive traits of psychological well-being, it is correlated to negative traits such as narcissism, ego defensiveness, and strict comparison to others as well (Barnard & Curry, 2011; Leary et al., 2007; Neff, Kirkpatrick, & Rude, 2007; Neff & Vonk, 2009).

Self-compassion is defined as kindness to self, a sense of belonging to human kind, and a here-and-now mindset (Neff, 2009). Self-compassion, as a construct, is correlated with several positive traits of psychological well-being (Barnard & Curry, 2011; Leary et al., 2007; Neff, 2009; Neff & Vonk, 2009). Self-compassion provides protection from severe impact of negative events and is often available when self-esteem reserves run out (Leary et al., 2007). Self-compassion also activates the same areas of the brain that are stimulated when others show compassion towards us; being self-compassionate releases oxytocin and calms the parasympathetic nervous system resulting in feelings of warmth and contentment (Gilbert, 2009; Irons, Gilbert, Baldwin, Baccus, & Palmer, 2006).

Self-criticism/self-judgment may lead toward disengagement and avoidance. Self-compassion, on-the-hand, leads to engagement and approach (Barnard & Curry, 2011; Gilbert & Proctor, 2006; Neff, 2009; Neff & Vonk, 2009). Unlike self-esteem, self-compassion shows no correlation to narcissism. Self-compassion seems to be more stable than self-esteem and appears to be correlated with positive traits of psychological well-being while self-esteem correlates with ego defensiveness and strict comparison to others. (Barnard & Curry, 2011; Leary et al., 2007; Neff, 2009; Neff & Vonk, 2009). Self-compassion remains stable even after self-esteem dissolves in the face of criticism (Leary et al., 2007). In addition, self-compassion is communal, whereas self-esteem and self-criticism are individualistic and isolating. The benefits of self-compassion's communal connection to humanity are felt even when individuals are alone or not directly interacting with other people in their proximity (Barnard & Curry, 2011; Gilbert & Proctor, 2006; Neff, 2009; Neff and Vonk, 2009). It is possible that self-compassion, rather than self-esteem, may be contributing to overall increases in psychological well-being associated with MM interventions.

Meditative walking as an Alternative and Complementary Treatment

Culture may play a role in the effectiveness of MM interventions. Many of the studies demonstrating significant outcomes are from Asian countries. These countries are more familiar with MM and with the types of MM most often studied. The differences between Eastern and Western cultures may influence outcomes. Western participants may be less familiar with the history, purpose, and types of movements used many of the MM interventions. This lack of familiarity may impact feelings of self-efficacy, the necessity for in-depth training, and expectations for Western participants (Payne &

Crane-Godreau, 2013). Walking, on-the-other-hand is familiar to participants. Mindful walking easily fits into the modern lifestyle and is easy to practice (Prakhinkit et al., 2014). The simplicity of the natural movements of walking as a mind-body therapy encourages greater faithfulness to habitual exercise and may increase commitment to mindful walking as a lifelong practice and way of being (Chow & Tsang, 2007). In addition, meditative walking is low-cost and requires no special training. Socioeconomic status has an impact on emotional and physical health. Many traditional exercise programs are not accessible for those experiencing poverty (Salmon, 2001).

Mindful walking or walking meditation is a frequently used form of mind-body intervention that has its roots in Buddhist practices. Mindful walking incorporates relaxation, awareness, breathing, and focused concentration with rhythmic walking (Salmon, 2001). Unlike traditional psychotherapy where short-term interventions are becoming increasingly valued due to outside pressures from third party interests, mindful walking can potentially become a way of life. Long-term change incorporating MM such as mindful walking offers a treatment that becomes a lifestyle rather than a coping mechanism to utilize during periods of distress (Gilpin, 2008).

Walking allows individuals to fall into a natural rhythm that allows observation of thoughts and feelings while also feeling content and peaceful. Walking brings about clarity of thought and serves as a metaphor for life and the therapeutic process – as a journey of steps, each taken one at a time (La Torre. 2004). Walking is an exercise that integrates motor and sensory function. It exercises the brain and is an activity that humans were meant to do. The bilateral movement involved in walking synchronizes the entire central nervous system (Weil, 1995).

Mild-intensity walking exercises are associated with psychological well-being (Asztalos, De Bourdeaudhuij, & Cardon, 2010). Researchers have found that meditative walking produces greater happiness than traditional exercise walking groups. For example, Shin, Y.-K. et al. (2013) demonstrated that meditative walking more effectively improves psychological well-being than traditional athletic walking and also explored the effects of Buddhist walking meditation and traditional aerobic walking on depression. The authors reported that both exercise groups saw increases in functional fitness such as improvements in muscle strength, balance, flexibility, and cardiorespiratory endurance. In addition, both exercise groups experienced lower plasma cholesterol, high-density lipoprotein cholesterol, triglyceride, and C-reactive protein, but only the Buddhist walking meditation showed decreases in low-density lipoprotein cholesterol, interlueikin-6 concentrations, and cortisol. Additionally, decreases in depressive symptomology were associated with the meditative walking group only. Authors concluded that Buddhist walking meditation was effective in improving functional fitness, decreasing depressive symptoms, and improving vascular reactivity. Buddhist walking meditation was, therefore, determined to produce more overall health improvements than traditional aerobic walking (Prakhinkit, 2014).

Walking a Labyrinth as an Alternative and Complementary Treatment

Labyrinths have been in existence for over 4,000 years. They are found in every culture, every time, and virtually every religion around the world. (Artress, 2008; Densford, 2007; West, 2000). Moving through the labyrinth is a type of walking meditation. The labyrinth is not a maze. There are no dead ends. The walker cannot get lost (Kumar, 2015). The labyrinth represents a symbolic archetypal representation of the

"original model from which all other similar persons, objects, and concepts are derived, copied, or patterned." (p. 480, Sandor, 2005). Many labyrinths are formed from a unicursal path contained in a circle – a primary archetypal symbol of the self and of wholeness (Sandor, 2005). The labyrinth's complicated, swirling path leads to an open area in the center and then back along the same path to return to the walker's everyday life (Kumar, 2015).

The walker learns to trust that the winding path will lead toward the center and out again. The walk becomes a metaphor for life. The path is confusing at first until the curvilinear path begins to become expected and the trust in the journey increases. In the same way that the walker may not be able to predict where the labyrinth path is going, walkers also recognize that they cannot predict the course of life, yet if they trust in the process of the walk (and of life), they will reach their destinations and have opportunity to reflect on their experiences along the way (Kumar, 2015).

Labyrinths are believed to be one of the most effective walking patterns (La Torre,2004). Labyrinths can be made of almost any material: stone, tile, grass, dirt, cement – even simple light and shadows (Artress, 2008). Figure 1, found in Appendix A, provides a visual sample of labyrinth patterns (Blonski, 2008). Labyrinths are available for walking in many communities (Fairbloom, 2003; Wolfelt, 2009). There are over 1,000 labyrinths located in churches, parks, schools, medical centers, and gardens across the United States (Sandor, 2005). Despite the increased popularity and development of labyrinths in public spaces, Knowledge of labyrinths is relatively limited in the general population (Fairbloom, 2003).

There is no consensus on the origin of the labyrinth, yet there are many interpretations of its use and culture-specific attributed meanings for its components. The meaning and interpretation of the labyrinth walking experience is open to the unique experience of the individual. There is no right or wrong way to walk a labyrinth - no expected or prescribed outcome. Each person brings his own journey to the labyrinth and leaves with his own perception of his time spent within the labyrinth (Artress, 2008; Sandor, 2005).

Walking a labyrinth brings together the mind, body, and spirit. It is a walking meditation that promotes healing from physical and emotional pain and illness. Labyrinths provide an opportunity for self-care and healing. Walking the labyrinth becomes a whole brain activity and affords awareness of the connections between inner and outer contexts of self (Sandor, 2005).

Much like the Buddhist walking meditation, walkers are encouraged to let go of expectations for their walk and experience whatever comes to them during the walk without trying to will the experience away. Walking in the labyrinth encourages acceptance of all emotions and feelings, openness to experience, and trust in the process (Sandor, 2005). Labyrinths can bring contentment to a difficult situation. They can produce a mindful calming of the mind, allow for self-soothing, and make space for healing (Densford, 2007). “The labyrinth can be a tremendous help in quieting the mind, because the body is moving. Movement takes away the excess charge of psychic energy that disturbs our efforts to quiet our thought processes.” (p. 25, Artress, 2008). Individuals who walk the labyrinth learn to trust that the path will eventually lead to the desired destination despite the twists and turns along the journey (Wolfelt, 2009).

Some believe there are three segments to the labyrinth walk: releasing, receiving, and returning. These segments are experienced on the walk in toward the center, while pausing at the center, and when returning to the outside. Many walkers choose to set an intention for their walk such as a statement for letting go or for greater understanding. Some may choose to repeat a mantra as they walk and others may pay attention to their stride, pace, their breath, or other bodily and contextual sensations. Some mental health professionals recommend that walkers spend time talking about, processing, and reflecting on their time in the labyrinth after they walk (Sandor, 2005; Sandor & Froman, 2006). Others, such as Artress (2008), believe there is no wrong way to walk a labyrinth. "Walking the labyrinth does not demand a great amount of concentration in order to benefit from the experience. The sheer act of walking a complicated path – which discharges energy – begins to focus the mind." (p. 71, Artress, 2008). In addition, there is no wrong way to incorporate labyrinth walking into the lifestyle. Some individuals walk regularly throughout their week and others choose to walk to celebrate or commemorate a special occasion such as the summer equinox, full moon, or an anniversary (Sandor, 2005).

Labyrinths not only provide an active, meditative experience, they also allow for the development of metaphors. These metaphors can be used by walkers in their daily lives and by walkers and therapists during more traditional therapy as a way to connect, communicate, and understand (Sandor, 2005). The journey of life is not a straight path and the curving labyrinth is "… a powerful symbol of journeying." (p. 23, West, 2000; Densford, 2007).

Walking a circular path, such as a labyrinth is not only a symbol of the life journey, but also represents wholeness and synthesis. Labyrinths not only provide an opportunity for healing for individuals. They also set the stage for connecting to humanity as a whole and learning to understand that we can accept and respect other people without needing to change them (West, 2000). Labyrinths are effective for approaching grief and loss, working through post-traumatic stress disorder, recovering from sexual abuse and substance abuse, healing physical illnesses, and transitioning through phase of life issues (Densford, 2007). Labyrinths have long been used for approaching grief. Grief is not a linear path toward a desired healed place. Grief often alternates between periods of acute intensity and calm subtlety. There often seems there is no rhyme or reason to the course; no way to predict the next steps. The journey of grief is very much like the winding path of the labyrinth (Kumar, 2015). It is possible that this kind of healing journey can be used for anxiety and depression in particular, transferring what is known about meditative walking and MM to the ease and simplicity of the labyrinth walk.

Further, many therapists believe that experiential and multi-sensory interventions can have much greater impact than traditional talk therapy alone (Densford, 2007).

> "I encourage my psychotherapy clients to walk the labyrinth in my garden before our sessions to facilitate turning inward and leaving everyday pressures behind, and afterward to let the issues raised in the therapy sessions settle into their psyches before returning to homes or jobs." (p. 10, West, 2000).

Movement around the circular labyrinth path affords client and therapist the opportunity to deepen their relationship, reduce anxiety, and lower resistance. Walking a labyrinth is not intended to replace or minimize other therapeutic interventions and approaches used in therapeutic sessions. It is meant to contribute and complement the traditional therapeutic process, enhancing treatment and the therapeutic relationship (La Torre, 2004). La Torre (2004) and West (2000) use walking as a part of individual therapy sessions. La Torre (2004) has built a labyrinth near her office to allow her clients to walk before, after, or during their sessions. Her clients often choose to walk the labyrinth near her office on their own after experiencing it with her in session (La Torre, 2004).

In addition to the healing aspects of the labyrinth, it is possible that labyrinths that are accessible to the public help to provide a space for creative expression and improved well-being (Densford, 2007). Walking a labyrinth allows inner wisdom, creativity, and intuition to move forward to give guidance on relationships, work, well-being, and health (West, 2000). Acceptance of the use of labyrinths may begin the process of destigmatizing mental health issues and treatment (Densford, 2007).

"Much more research needs to be done to understand fully the magnificence of this sacred pattern." (p. 68, Artress, 2008).

Problems with Rigor

There are many challenges inherent in exercise and mind-body therapy research (Kinser & Robins, 2013; Oh et al., 2013; Payne & Crane-Godreau, 2013; Salmon, 2001). It is important to ensure that testing of mind-body therapies such as meditative movement utilize scientific rigor. Many authors have detailed the weaknesses of meditative

movement interventions to date and some guidelines have been suggested to successfully improve design and reporting (Kinser & Robins, 2013; Oh et al., 2013).

Payne and Crane-Godreau (2013) offer many recommendations for continued study of MM. Many of these recommendations are for improved scientific rigor. The authors acknowledge the difficulty of studying interventions from a mind-body perspective. Suggestions for improvement included options for blinding, improved selection procedures, larger sample sizes, operational definition of terms, transparency of methods and analysis, better control procedures, and improved experimental design. Despite the weaknesses of the MM studies reviewed and the acknowledged difficulty of exploring MM interventions, Payne and Crane-Godreau (2013) stated that the "remarkably positive results obtained in some studies, even when MM was compared to an active targeted intervention," justify further study of MM interventions (p. 7). Suggested future directions included, similar studies those already completed but with improved rigor, investigation into the possible mechanisms of the effects of MM, exploration of the impact of frequency and duration of intervention, study of more forms of MM, and study of the effects of MM with individuals who experience symptoms of depression and/or anxiety (Payne & Crane-Godreau, 2013; Salmon, 2001; Sandor & Froman, 2006). The cost-effectiveness and documentation of no adverse outcomes of MM interventions further justify continued exploration and study as well (Payne & Crane-Godreau, 2013).

In addition to the suggested guidelines, control group design must be considered. There are five different approved options for control groups: concurrent groups, concurrent placebo groups, no-treatment concurrent groups, dose-response concurrent

groups, active/positive concurrent groups, and external/historical groups. Several of these control group options are not viable due to the ethical concerns. For example, a no-treatment control group would not be an ethical option given the danger of leaving human science research participants with no treatment or intervention, particularly when studying clinical populations. Placebo control groups are difficult with mind-body therapies such as movement meditation because it is difficult to develop an appropriate and convincing "sham" intervention (Kinser & Robins, 2013).

Current control group options used in mind-body research include: usual care groups, WCG, ACGs, and dismantling or add-on groups. The most commonly used control groups are the usual care and WCG. Usual care groups involve allowing participants to receive traditional care for their symptoms. WCG place some participants on a WCG while continuing with their usual care and then allow these participants to eventually receive the intervention. ACGs allow participants to receive some type of intervention that involves similar time, expectations, and attention to the research participants. Finally, dismantling or add-on control groups allow for a group where the intervention components are studying in isolation or added to another intervention to study the process or mechanism involved (Kinser & Robins, 2013).

Many reviewed studies that choose to use ACGs did not control for time and attention. However, some studies implement exercise groups that receive the same amount of psychoeducation, receive the same amount of time and attention from researchers, and follow the same frequency and duration of sessions as the TG as ACG. Those studies that attempt to provide equal time, attention, training, and process to a

different activity provide an opportunity to put greater faith in reported outcomes (Kinser & Robins, 2013).

Another popular control design, the WCG, offers an opportunity to have a no-treatment control that later receives the treatment and participants may also have different expectancies as they wait for treatment. It is important to control for bias in this design as researchers may have expectations for how control and TGs will perform. It is also imperative to ensure that the WCG group receives the same time and attention as the TG as it is easy to rush this group or not provide the same effort in treatment. It may be difficult to keep participants interested while they wait; therefore, attrition is also a concern when using WCG (Kinser & Robins, 2013).

VITA

Sara J. Hills

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE EFFECTS OF WALKING A LABYRINTH ON SYMPTOMS OF DEPRESSION AND ANXIETY AND LEVEL OF SELF-COMPASSION

Major Field: Counseling Psychology

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Counseling Psychology at Oklahoma State University, Stillwater, Oklahoma in July, 2018

Completed the requirements for the Master of Science in Educational Psychology at Oklahoma State University, Stillwater, Oklahoma in 2014.

Completed the requirements for the Bachelor of Arts in Elementary Education at the University of Iowa, Iowa City, Iowa in 2000.

Experience:

2017-2018 Pre-Doctoral Intern, Tulsa Center for Child Psychology

2016-2017 Graduate Intern, VA Medical Center, Family Mental Health

2015-2017 Grief Counselor, Oklahoma State University Counseling Center

2015-2016 Graduate Intern, OUHSC, Physician's Child Study Center

2014-2015 Graduate Intern, OUHSC, Physician's Pediatric Diabetes and Endocrinology Clinic